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**Cost-Benefit Analysis of Computer-Assisted Mining Through Production and Cost Modeling:
An Update of IC 9281**

By Suresh K. Bhatt

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UNIT OF MEASURE ABBREVIATIONS USED IN THIS REPORT

ft	foot	st	short ton
h	hour	st/min	short ton per minute
in	inch	st/worker-day	short ton per worker-day
min	minute	\$/st	dollar per short ton

COST-BENEFIT ANALYSIS OF COMPUTER-ASSISTED MINING THROUGH PRODUCTION AND COST MODELING: AN UPDATE OF IC 9281

By Suresh K. Bhatt¹

ABSTRACT

A mathematically simulated modeling technique is used in this U.S. Bureau of Mines report to represent a hypothetical mining operation with existing mining technology and prevalent mining costs. Mining scenarios were prepared and evaluated for potential benefits and costs available through computer-assisted mining. Base criteria, parameters, and methodology are described.

¹Mining engineer, Pittsburgh Research Center, U.S. Bureau of Mines, Pittsburgh, PA.

INTRODUCTION

A mining operation can be represented by two models—production and cost. In order to evaluate the cost benefits of mining scenarios for computer-assisted mining, it is necessary to develop a model representative of existing mining technology and cost of mining. This report by the U.S. Bureau of Mines first identifies and selects major base parameters and criteria to be used in the development of base production and cost models to represent a hypothetical mine with existing technology. Improvements in production, cost, or both are applied to the base models to realize the potential benefits of computer-assisted continuous mining systems through various mining scenarios. The scenarios include different combinations of increased mining efficiency and shift uptime.

Mining costs and simulated mining operations are based on an actual 12-month period. The production model is prepared employing mathematical simulation technique, keeping in view the following: (1) mine history, production, and cost, (2) production delay records, (3) equipment maintenance records, (4) industrial engineering data, (5) physical mine conditions, and (6) mining industry experience.

When cost of mining is estimated, prevalent United Mine Workers of America (UMWA) hourly rates and guidelines are used, where applicable; other cost items are representative of similar mining operations.

Anticipated improvements in productivity or cost are then applied for each scenario that can be obtained through computer-assisted mining and compared with existing mine models. If a significant reduction in cost of mining results, the scenario is investigated in depth. All potential improvements are first modeled individually and then collectively to realize the overall impact on cost of mining. All backup computer printouts are appended to this report to show the model output and to assist people in the mining industry and elsewhere in gaining a thorough understanding of the modeling technique for their particular needs. Appendix A is a glossary for base (appendix B) and improvement (appendix C) models.

This modeling technique provides the USBM with a tool for evaluating new mining technologies, helping in achieving its goal of improving health conditions, safety, and efficiency in the mining industry.

This update addresses a high-productivity and -cost mine scenario, typical of 1992.

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BASE CRITERIA AND PARAMETERS FOR MINING SCENARIOS

GENERAL MINE DESCRIPTION

The hypothetical underground mine, located in the Eastern United States, operates in a relatively flat coal seam, approximately 5 ft thick on average, employing continuous mining methods. The topography in the area is generally mountainous and relatively severe; average cover over the seam is about 500 ft.

A slope belt delivers the mined coal out to surface. This slope also contains a track for transporting supplies. Mine ventilation is provided by the slope and two double-compartment shafts. One of these shafts serves as a portal for personnel.

The mine employs 35 salaried and 185 UMWA personnel for a total of 220. Mining is accomplished through the use of six continuous miners, five normally set for production and one for construction work. Four production crews are scheduled to operate continuous miner sections in each of the three shifts for a total of 12 scheduled shifts

of production each day in the following areas: (1) mains development, (2) submains development, (3) longwall panel development, and (4) room-and-pillar section.

The mine produces approximately 1 million st of clean coal annually in 240 working days. The productivity per worker-day is about 18 st. Cost of mining for this period is in the range of \$30/st to \$32/st.

The mine employs belt haulage for coal transportation and mine track with trolley wire for supplies and personnel transportation close to working sections. In the working face area, rubber tire supply cars moved by battery equipment are utilized.

SURFACE FACILITIES AND ARRANGEMENTS

Mine surface facilities include a building housing mine offices, bath and change house, lamproom, and warehouse. Other facilities include a mine maintenance and repair shop, hoist house for slope, supply yard, and a mine

exhaust fan. A coal processing plant prepares the run-of-mine coal and supplies it to a mine-mouth powerplant via a system of overland conveyors. A number of sedimentation ponds are situated in the general mine vicinity. Trucks are used to supply coal to the powerplant as an alternate mode. Trucks are also used to transport refuse material from the plant to the dumping areas. Electric power to the mining complex is supplied from the nearby power station.

MINING METHODS AND EQUIPMENT

The mining systems include development of main headings, submains, longwall panels, and butt panel for room-and-pillar mining. At present, no longwall or pillar mining is being conducted. Full roof bolting is practiced throughout the mine. A two-shuttle-car (S.C.) system is used for face coal haulage. All section belts are 36 in wide and equipped with feeders. A single-split system ventilates the working sections. Mining section equipment models are standardized and typically include one Lee Norse 265 HH continuous miner² and one Stamler BF-2 feeder.

BASE PRODUCTION AND COST MODELS AND MINING SCENARIOS

The existing mine is simulated through the two mathematical models, production and cost, utilizing a typical 1-year period and shown by appendix B. Five continuous miners are set for production in the following areas: (1) sections 1 and 2—two units in seven-heading mains, (2) section 3—one unit in three-heading longwall development section, (3) section 4—one unit in five-heading submains, (4) section 5—one unit in room-and-pillar development section, and (5) section 6—one unit employed for mine construction work.

The following sections relate to the appended models (appendixes B and C) entitled "Mine Production Model by Continuous Miner Section" and "Cost of Mining Statement." Various mining scenarios, which will be considered in potential cost-benefit analysis for computer-assisted mining, are also described.

MINE PRODUCTION MODEL

The model represents a six-section (including construction) mine producing 956,369 st of clean coal annually. Most of the items are self-explanatory; however, those needing explanations are appropriately defined and include the methodology for obtaining them.

Minutes per shift.—Scheduled production shift is 8 h or 480 min.

PERSONNEL

A section crew consists of a continuous miner operator, continuous miner helper, two S.C. operators, one roof bolter, one roof bolter helper, one utility person, and a mechanic-electrician (total eight). Each section has a supervisor. Other UMWA personnel include general inside, general outside, maintenance, and preparation. Table 1 gives the UMWA personnel breakdown by work category for the example mine.

Table 1.—Example of number of UMWA mine personnel, by work category

Work category	
Section	96
General inside	32
Maintenance	24
Preparation	25
General outside	8
Total	185

Travel time.—This period includes man-trip in and man-trip out. Man-trip in is total time to travel from mine portal to dinner hole in a working section, excluding any major delays, but including traveling in mantrip cars and walking. Similarly, man-trip out is the time from dinner hole in the section to the outside (mine portal) and includes waiting for mantrip and walking from the dinner hole to the mantrip car, but excludes major delays.

Lunch time.—It is normally 30 min. If a crew is relieved for lunch, the time for lunch would be zero.

Service time.—It is the scheduled maintenance time for major pieces of section equipment during a production shift. In this case, it is combined with another work element, "cleanup and prepare to mine," described later.

Remaining operating time.—Total shift minutes (480) minus travel, lunch, and service time give this value. The next major category in the production model is *downtime* for various equipment items and mining conditions. Equipment delays and mine physical conditions that disrupt the production cycle are listed. These delays can be due to mechanical breakdowns or other conditions rendering equipment unavailable for production. These delays are normally referred to as the "section downtime." Items include continuous miner, S.C., section belt conveyor, belt feeder, and section power supply. Additional roof control, if required in the section because of roof and rib conditions, comes under *timber and rail*. Other natural conditions such as floor heaving, rock bursts, and water

²Reference to specific products does not imply endorsement by the U.S. Bureau of Mines.

and mud in the roadways, are listed under *conditions*. Any safety-related delays are listed separately if time is required solely for the section safety, e.g., increasing ventilation to dilute excessive gas and conducting safety checks on equipment and the section, in addition to the "safety meeting" before the crew proceeds to the working section. After reaching the dinner hole, the section supervisor holds a meeting discussing safety concerns with the workers, actual accident findings, unsafe work practices, or new regulations that may impact the section safety.

Cleanup and prepare to mine (C/PTM) is a major work activity that is done toward the end of the shift. It includes servicing the equipment and cleaning up the face, using shovel or scoop, so that the section is ready for the next shift. Servicing the equipment includes making necessary maintenance checks (oil levels) and taking care of such requirements, changing bits, lubricating, adjusting safety or monitoring devices, and the like, which is typically needed after a shift's operation.

Other preparatory work begins after the safety meeting, i.e., traveling from the dinner hole to the equipment and moving the equipment to the face (tramming and cable handling) and ends when the continuous miner begins to load the first S.C. Also, time is consumed in withdrawing equipment from the working face after loading the last S.C., walking to the dinner hole, and any waiting (reasonable) prior to leaving the dinner hole.

All these items (previous paragraph) are lumped in a separate delay category; in this case, they are listed under *model adjust delays*, which also includes any improperly reported or unaccountable delays. The purpose of this category is to provide a means of adjusting the model to make it practical and consistent with normal worker efficiency and equipment utilization.

Unit shift is the number of operating shifts for a particular mining machine unit during the year.

The next group of data in the model tabulation is called "place data" and relates to physical working face characteristics.

A "working place" is a three-dimensional unit; in this case, it is a cut made by the continuous miner (approximately 20 ft deep by 18 ft wide by 5 ft high). *Cubic feet/place* is the volume of a cut, and when this figure is multiplied by the density (pounds per cubic foot) of the mined material (seam, roof, and floor), it gives the raw tonnage per cut (place). This figure divided by the S.C. capacity gives the number of S.C.'s per place. Raw product is converted to clean tonnage applying an appropriate coal recovery factor.

The next group of data is identified as *place time* and represents the time necessary to complete mining activities in a cut. Based on time studies and general observations, typical unit rates for mining-loading, maneuvering, and S.C. change are developed. These rates, when multiplied

by number of cars per place, provide total time for a particular event with one exception. S.C. change time is the time a S.C. is away from the continuous miner, excluding major delays that prevent the car from returning to the continuous miner in the average time governed by the haul distance. The average S.C. change time in a place (cut) is equal to the total car change time divided by the "number of car changes" (equivalent to total S.C. loaded minus one).

There is no S.C. change after the last car is loaded nor before the first car is loaded. The normal practice, therefore, is to reduce the number of cars by one or eliminate the fractional part and multiplying it by average S.C. change time to obtain the total S.C. change per cut. Total loading and maneuvering times are obtained by simply multiplying total number of cars per place by unit (per car) values.

Other place work elements like "gas test" (mandatory, every 20 min while mining), "extending ventilation," and erecting "safety posts" right after mining (loading) a cut, before permanent supports (bolts) are installed, constitute additional necessary delays in a mining cycle. The continuous miner then has to be trammed to the next place; this time, including handling cable, is listed under *tram*. These time values are added and the total time is called *total place time*.

Maneuvering (continuous miner) time is the time for maneuvering the equipment when the S.C. is with the continuous miner. As the name implies, *roof bolting place time* is the time to complete bolting operations in a cut so that the continuous miner can move in for another cut. So long as the *roof bolting place time* is "less" than the *mining place time*, *mining place time* determines the number of places mined per shift. When *roof bolting place time* is "greater" than *mining time* or *roof bolting place time* becomes a bottleneck, the number of cuts are reduced accordingly, since *roof bolting place time* then prevails.

Place time, mining or bolting, is the greater of the two divided into *remaining uptime* to give the number of places per unit shift. Productivity in clean short ton per unit shift is obtained by multiplying the number of places (cuts) to the tonnage per place. The tonnage per minute or hour represents the value per remaining uptime. The value per unit shift multiplied by total unit shifts provides total annual short tons by the mining section. Similarly, the values are tabulated for other mining sections. The values (average) of line items in the last column of the model are *weighted averages* according to the unit shifts in various section categories.

MINE COST MODEL

This model or "cost of mining statement" provides detailed cost breakdowns by line item. The annual cost is

provided in total dollars and also in dollars per clean short ton. Individual cost items are termed either "fixed" or "variable." Fixed means fixed dollars for a particular period; in this case, it is 1 year. Examples are *labor*, *overhead*, and *depreciation*. Variable cost varies per shift, day, or month, depending on tonnage produced. Examples are *royalties*, *Federal black lung fee*, and *supplies—operating*. Any change in a mine production model will have an effect on its cost model. For example, new equipment used for increasing mine production will have a twofold effect: (1) overall cost per short ton reduced, and (2) depreciation line item or leasing cost increased.

The example mine cost model shows a cost of \$32.44/st on clean coal basis for the base year 1992.

MINING SCENARIOS FOR COMPUTER-ASSISTED MINING

While considering potential mining scenarios, all equipment and mining systems are assumed to remain unchanged in the existing mine with the exception of the continuous mining machine. The mining machine is envisioned to be operated by computer-assisted control, from a distance of 250 to 1,000 ft (based on number of headings in a mining section). The operator compartment is situated near the section-belt tailpiece in the fresh intake air. The operator is able to control all functions of the mining machine—cutting, tramming, etc.—through visual, aural, and other displays in the compartment employing proven computer technology.

Normal mining cycle begins as the continuous miner advances the coal face on the ventilation side of a heading or crosscut. Extraction of coal in the immediate face is continued using a S.C. to haul the coal to the belt tailpiece until the farthest depth of penetration (20 ft) is reached. Upon completing both passes in the cut (18 ft), the continuous miner is trammed to the next heading or crosscut, according to the cut-sequence plan. A roof bolting machine then enters the mined-out face to bolt the place in accordance with the approved roof control plan. The mine utilizes conventional shell-type (4-ft) bolts. After the roof bolting is completed, the face area is cleaned up and rock dusted.

A computer-assisted continuous miner will enhance the section productivity because of the following: (1) reduced equipment downtime, thereby increasing available operating time (uptime); and (2) reduced mining cycle time, thereby providing additional number of cuts per shift.

The productivity is increased simply by making the mining equipment "available" for more time and increasing its "utilization" (compared to the manually operated system). By effective planning of mining operations, standardization, maintenance and spare parts inventory, improving the relations between management and labor, training, and

coordination, it is possible to make more efficient utilization of labor. In addition, the quality of mined product can be controlled effectively to provide a consistent output to the beneficiation plant and the user.

The most important team player in the mining section is the continuous mining machine operator. In the computer-assisted section, this person is highly skilled to operate the machine and qualified enough to make necessary judgments in the mining operations. He or she has the authority of a section supervisor and is able to work independently. A mining machine helper is not needed on a full-time basis. The role of a section supervisor involves noncontinuous miner operations and can be called a "coordinator" or nominal section boss. Similarly, the mechanic-electrician is highly skilled to maintain the sophisticated mining machine. The role of utility personnel is also reduced as the mining machine performs the most face cleanup functions. Since the continuous miner operator is to be involved in management and decisionmaking roles, it may be appropriate to make him or her a salaried employee. Necessary mine operations data have to flow to all employees involved, salaried and UMWA, requiring an effective mode of distribution and coordination to properly organize, operate, and maintain the advanced mining equipment.

Computer technology will enable improved monitoring of equipment condition to help early detection of faulty problems and breakdowns, allowing necessary preventative maintenance. Better maintenance planning not only improves equipment availability, efficiency, and productivity, but also reduces mining cost by maintaining a minimum inventory of spare parts.

Since the operator is located in a safer, cleaner, and relaxed environment and not doing monotonous work, he or she is subject to less physical and mental tension or fatigue and, therefore, is able to work with greater efficiency and accuracy, and maintain high standards and housekeeping.

In the example mine, two scenarios are considered:

1. Continuous miner operating at existing efficiency reflected by existing loading rate, but for longer available time (uptime increased by 30 min, 40 min, and 50 min).
2. Continuous miner operating at improved efficiency reflected by new loading rate (existing rate increased by 25%, 50%, 75%, and 100%) and for longer available time as stated above.

Improved efficiency increases the tram rate and reduces cable handling delays. An appropriate percentage for this improvement will be applied in all the models.

Basis of increasing the "remaining uptime" follows: Face cleanup is effectively done by the remote-controlled continuous miner during the mining cycle. The need of

utility personnel otherwise needed (with scoop or shovel) is significantly reduced. The continuous miner downtime can be minimized or eliminated (saving 10 min). Since the continuous miner operator is away from the hazardous work face, it can be assumed that *safety*-related downtime is improved by 15 min. Prudent engineering and operating practices can further improve productivity of a mine; for example, maintain a continuous miner when belt or S.C.'s are down. An effective maintenance program can further

reduce the S.C. and belt downtimes by 10 and 15 min, respectively.

Model adjustment and *other* delays provide room for further improvement.

A review of the section work force (now a seven-person crew) indicates that the crew can be reduced by one person with the new mining system. Various improvement ideas discussed in this section will be modeled when conducting cost-benefit analysis for computer-assisted mining.

COST-BENEFIT ANALYSIS FOR COMPUTER-ASSISTED MINING

In the example hypothetical mine, two scenarios are considered for computer-assisted mining:

1. Continuous miner operating at existing efficiency, reflected by existing loading rate (1.30 min per car), but for longer available time (uptime increased by 30 min, 40 min, and 50 min). This situation provides three production models.

2. Continuous miner operating at improved efficiency, reflected by new loading rates (existing rate increased by 25%, 50%, 75%, and 100%) and for longer time, i.e., increasing uptime by 30 min, 40 min, and 50 min, as stated above. The new rates are 1.04 min per car, 0.87 min per car, 0.74 min per car, and 0.65 min per car for the four efficiencies. The figures used in this example signify the relative importance and not necessarily their absolute values. One minute per car means a loading rate of 7 st/min, which is a reasonably high number as an annual average rate. This condition provides a total of 12 production models.

Another improvement common to all models is improved tram time, or 60% of normal time.

Each production model has a corresponding cost model. The new mining system has resulted in the following changes:

The crew size is reduced by 1 person (now a 7-person crew); the total reduction is 12 personnel for 12 working shifts. It is assumed that continuous miner helper and utility personnel will be needed for one-half of their times or one person should replace two.

By effective planning of mine operations, standardization, maintenance, and spare-parts inventory, and improving the relations between management and labor, it is possible to more efficiently utilize the work force.

The reduction of 12 personnel out of the total 185 UMW personnel represents a 6% decrease in the hourly labor, benefits, and welfare costs. These line items on the

cost of mining statement are A2, A4, and A11. The new values for these items are \$6,677,760, \$2,671,480, and \$940,000.

It is estimated that the capital cost requirement for continuous miner additions including computer and mobile control structure is \$250,000. Assuming interest at 10% and straight line depreciation over 7 years (no salvage value), the increase in annual interest expense, line item B5, is \$25,000, and the increase in line item C1 is \$35,714. The new values for B5 and C1 are \$525,000 and \$635,714, respectively. Refer to the particular model for details.

The five changes shown above (two scenarios and three improvements) are applied to all cost models. The productivity figure (short ton per worker-day) in each cost model is now calculated using new production and work force (new mine total, 208).

Table 2 summarizes the results of 15 production and cost models along with the base case. Detailed information on base and improvement cost and production models is given in the appendixes.

Comparing the highest production and corresponding cost figures, 1,385,679 st and \$23.33 to the base figures, 956,369 st and \$32.44, the resultant improvements are 45% and 28% for production and cost, respectively. Similarly, comparing the lowest improvement figures, 1,119,529 st and \$27.82, to the base case, the resultant production and cost improvements are 17% and 14%, respectively. The midpoint of the range is 31% for production and 21% for cost improvement.

Because of possible variations in mining conditions, data limitations, inherent imprecision in any simulating system, necessity of using judgments, and the human factors involved where changes are projected, it is believed reasonable to expect 75% to 125% attainment of the results projected.

Conservatively, it can be assumed that the new mining system can improve mine production by 23%, resulting in a cost-of-mining improvement of 16%.

Table 2.—Summary of results of 15 production and cost models compared with base case

Mine model	Uptime increase, min	Annual production, clean st	Cost of mining, \$/st
Existing technology (base case)	0	956,369	32.44
Computer-assisted mining:			
Normal efficiency	30	1,119,529	27.82
Do.	40	1,157,779	27.05
Do.	50	1,196,030	26.33
Increase efficiency by 25%	30	1,199,259	26.27
Do.	40	1,240,233	25.55
Do.	50	1,281,206	24.87
Increase efficiency by 50%	30	1,250,984	25.36
Do.	40	1,293,722	24.67
Do.	50	1,336,461	24.02
Increase efficiency by 75%	30	1,285,552	24.80
Do.	40	1,329,465	24.13
Do.	50	1,373,378	23.50
Increase efficiency by 100%	30	1,297,077	24.62
Do.	40	1,341,378	23.95
Do.	50	1,385,679	23.33

Although the mine scenario assumes a 6% reduction in face work force, it is not a true representation as it does

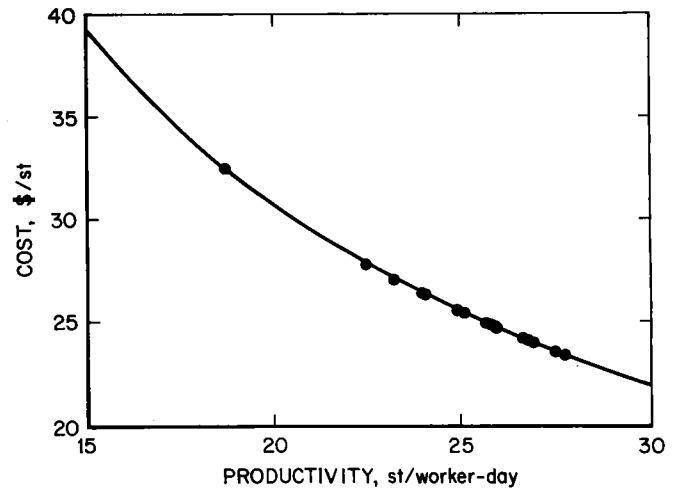


Figure 1.—Relationship of productivity and cost of mining.

not address potential increase in service personnel. The change in work force will vary with company size, organizational philosophy, system's success, and penetration in the industry, and is not estimated at this time.

Figure 1 shows the relationship of productivity (short ton per worker-day) and cost of mining (dollar per short ton), as obtained from the base and improvement cost and production models.

CONCLUSIONS

A computer-assisted mining machine can increase mine productivity and reduce the cost of mining. Also, it provides a safer and healthier work environment.

Estimates indicate a potential increase of 23% in mine productivity, reducing the cost of mining by 16%, considering a high-productivity and -cost mine scenario.

APPENDIX A.—GLOSSARY FOR PRODUCTION AND COST MODELS FOR APPENDIXES B AND C

Adj. Time St. Data.—Adjusted time study data represent a practical model consistent with normal worker efficiency and equipment utilization.

C/PTM.—Clean up and prepare to mine.

Model Adjust Delays.—Delays required to adjust a model. Includes improperly reported or unaccountable delays.

Place.—A three-dimensional unit or cut mined by a mining machine (approximately 20 ft deep by 18 ft wide by 5 ft high).

Place Time.—Time required to mine a cut.

Roof Bolting Place Time.—Time required to bolt a place.

S.C.—Shuttle car with 7-st raw coal capacity.

Unit Shift.—A mining unit operating an 8-h shift.

WTD AV.—Weighted average values based upon number of unit shifts.

APPENDIX B.—COMPUTER PRINTOUTS OF BASE PRODUCTION AND COST MODELS DATA

MINE PRODUCTION MODEL BY CONTINUOUS MINER SECTION						
ITEM IDENTIFICATION	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6 TOTAL/AVG
Minutes Per Shift	480.0	480.0	480.0	480.0	480.0	480.0
Travel Time	60.0	62.0	65.0	58.0	62.0	61.7
Lunch Time	30.0	30.0	30.0	30.0	30.0	30.0
Service Time	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Operating Time	390.0	388.0	385.0	392.0	388.0	388.3
Downtime						
Miner	22.8	25.0	18.0	29.4	10.0	22.9
S.C.	15.0	10.2	12.0	15.5	12.0	13.7
Belt	21.0	22.2	28.0	18.5	21.0	21.9
Bolter	4.8	5.0	6.0	5.9	8.0	5.7
Feeder	3.0	3.8	4.2	3.6	5.0	4.3
C/PTM	30.5	31.0	22.0	28.8	35.0	30.2
Power	1.8	1.0	2.0	2.5	2.8	1.9
Timber & Rail	2.0	2.9	3.0	5.0	5.3	3.5
Conditions	5.0	5.8	6.0	2.5	4.2	4.5
Safety	18.0	15.5	16.8	20.0	17.0	17.2
Model Adjust Delays	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0
Total Downtime	123.9	122.4	118.0	131.7	120.3	125.7
Remaining Uptime	266.1	265.6	267.0	260.3	267.7	262.6
Unit Shifts/Year	502	480	536	528	354	380 2780
Cubic Feet/Place						
Density	1710.7	1731.7	1857.4	1880.0	1642.8	1724.9
Raw Tons/Place	94.50	94.50	94.50	94.50	94.50	94.50
Raw Tons/S.C.	80.8	81.8	87.8	88.8	77.6	81.5
No. S.C./Place	7.0	7.0	7.0	7.0	7.0	7.0
Reject %	11.5	11.7	12.5	12.7	11.1	11.6
Clean Tons/S.C.	22.80	22.80	22.80	22.80	22.80	22.80
	5.40	5.40	5.40	5.40	5.40	5.40
Place Time						
Mining	15.01	15.20	16.30	16.50	14.42	15.14
Maneuvering	3.46	3.51	3.76	3.81	3.33	3.46
S.C. Change	17.60	17.60	21.60	15.60	13.20	17.12
Gas Test & Safety	0.00	0.00	0.00	0.00	0.00	0.00
Ventilation & Posts	6.60	6.60	6.60	6.60	6.60	6.60
Tram	5.80	6.00	6.10	5.50	5.00	5.80
Total Place Time	48.47	48.91	54.36	48.01	42.55	48.10
Roof Bolting Place Time	38.80	40.20	39.50	38.75	36.80	38.67
Places/Unit Shift	5.490	5.431	4.912	5.422	6.292	5.53
Productivity - Clean Coal						
Tons/Unit Shift	342.6	343.0	332.8	371.8	377.0	344.0
Tons/Hour	77.2	77.5	74.8	85.7	84.5	78.6
Tons/Minute	1.287	1.292	1.246	1.428	1.408	1.310
Annual Production, st	171,973	164,663	178,377	196,327	133,473	956,369

Cost of Mining Statement
Base Year 1992

Basis of Estimates	Adj. Time St. Data
Days of Operation	240
Total Production (Clean st) (000)	956.369
Daily Production (Clean st)	3,985
Approx. st/worker-day	18.113

Cost basis	Dollars (000)	\$/st
A. Direct Operating Costs		
* 1. Labor - Salaried	1,575.000	1.647
* 2. Labor - Hourly	7,104.000	7.428
* 3. Benefits - Salaried	473.000	0.495
* 4. Benefits - Hourly	2,842.000	2.972
5. Supplies - Operating	2,419.614	2.530
* 6. Supplies - Maintenance	5,001.000	5.229
* 7. Power	1,200.000	1.255
* 8. FICA & Unemployment Taxes	960.560	1.004
* 9. Workmans Compensation Ins.	1,800.000	1.882
* 10. Black Lung Comp. Ins.	2,000.000	2.091
* 11. Welfare - Hourly	1,000.000	1.046
12. Welfare - Tonnage	0.000	0.000
* 13. Safety Expenses	250.000	0.261
* 14. Production & Safety Incentives	300.000	0.314
* 15. Accident Costs	300.000	0.314
16. Reclamation Fee	143.455	0.150
17. Federal Black Lung Fee	1,052.006	1.100
* 18. Other Costs	0.000	0.000
Total	28,420.635	29.717
B. Other Cash Costs		
* 1. Overhead	300.000	0.314
2. Royalties	605.382	0.633
3. Miscellaneous Taxes	0.000	0.000
* 4. Equipment Leasing Costs	600.000	0.627
* 5. Interest Expense	500.000	0.523
* 6. Miscellaneous Income	0.000	0.000
Total	2,005.382	2.097
C. Other Costs		
* 1. Depreciation	600.000	0.627
2. Amortization of Development Costs	0.000	0.000
3. Depletion	0.000	0.000
Total	600.000	0.627
Total Cost of Mining	31,026.016	32.441

* Fixed Dollars Per Year

APPENDIX C.—COMPUTER PRINTOUTS OF IMPROVEMENT MODELS— PRODUCTION AND COST DATA

MINE PRODUCTION MODEL BY CONTINUOUS MINER SECTION IMPROVED UPTIME BY 30 MINUTES

ITEM IDENTIFICATION	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	TOTAL/AVG
Minutes Per Shift	480.0	480.0	480.0	480.0	480.0	480.0	480.0
Travel Time	60.0	62.0	65.0	58.0	62.0	64.0	61.7
Lunch Time	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Service Time	0.0	0.0	0.0	0.0	0.0	0.0	
Remaining Operating Time	390.0	388.0	385.0	392.0	388.0	386.0	388.3
Downtime							
Miner	12.8	15.0	8.0	19.4	0.0	20.0	12.9
S.C.	5.0	0.2	2.0	5.5	2.0	8.2	3.7
Belt	11.0	12.2	18.0	8.5	11.0	9.5	11.9
Bolter	4.8	5.0	6.0	5.9	8.0	4.6	5.7
Feeder	3.0	3.8	4.2	3.6	5.0	6.8	4.3
C/PTM	30.5	31.0	22.0	28.8	35.0	38.0	30.2
Power	1.8	1.0	2.0	2.5	2.8	1.9	2.0
Timber & Rail	2.0	2.9	3.0	5.0	5.3	3.0	3.5
Conditions	5.0	5.8	6.0	2.5	4.2	2.8	4.5
Safety	18.0	15.5	16.8	20.0	17.0	15.1	17.2
Model Adjust Delays	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Downtime	93.9	92.4	88.0	101.7	90.3	109.9	95.7
Remaining Uptime	296.1	295.6	297.0	290.3	297.7	276.1	292.6
Unit Shifts/Year	502	480	536	528	354	380	2780
Cubic Feet/Place	1710.7	1731.7	1857.4	1880.0	1642.8	1409.4	1724.9
Density	94.50	94.50	94.50	94.50	94.50	94.50	94.50
Raw Tons/Place	80.8	81.8	87.8	88.8	77.6	66.6	81.5
Raw Tons/S.C.	7.0	7.0	7.0	7.0	7.0	7.0	7.0
No. S.C./Place	11.5	11.7	12.5	12.7	11.1	9.5	11.6
Reject %	22.80	22.80	22.80	22.80	22.80	22.80	22.80
Clean Tons/S.C.	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Place Time							
Mining	15.01	15.20	16.30	16.50	14.42	12.37	15.14
Maneuvering	3.46	3.51	3.76	3.81	3.33	2.58	3.46
S.C. Change	17.60	17.60	21.60	15.60	13.20	15.30	17.12
Gas Test & Safety	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ventilation & Posts	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Tram	3.48	3.60	3.66	3.30	3.00	3.75	3.48
Total Place Time	46.15	46.51	51.92	45.81	40.55	40.60	45.79
Roof Bolting Place Time	38.80	40.20	39.50	38.75	36.80	37.00	38.67
Places/Unit Shift	6.416	6.356	5.720	6.337	7.342	6.801	6.48
Productivity - Clean Coal							
Tons/Unit Shift	400.4	401.5	387.6	434.6	440.0	349.6	402.7
Tons/Hour	81.1	81.5	78.3	89.8	88.7	76.0	82.6
Tons/Minute	1.352	1.358	1.305	1.497	1.478	1.266	1.376
Annual Production, st	200,980	192,719	207,744	229,470	155,752	132,863	1,119,529

Cost of Mining Statement
Base Year 1992

Basis of Estimates	Adj. Time St. Data	Uptime by 30 Minutes
Days of Operation	240	240
Total Production (Clean st) (000)	956.369	1,119.529
Daily Production (Clean st)	3,985	4,665
Approx. st/worker-day	18.113	22.426

Cost basis	Dollars(000)	\$/st	Dollars(000)	\$/st
A. Direct Operating Costs				
* 1. Labor - Salaried	1,575.000	1.647	1,575.000	1.407
* 2. Labor - Hourly	7,104.000	7.428	6,677.760	5.965
* 3. Benefits - Salaried	473.000	0.495	473.000	0.422
* 4. Benefits - Hourly	2,842.000	2.972	2,671.480	2.386
5. Supplies - Operating	2,419.614	2.530	2,832.408	2.530
* 6. Supplies - Maintenance	5,001.000	5.229	5,001.000	4.467
* 7. Power	1,200.000	1.255	1,200.000	1.072
* 8. FICA & Unemployment Taxes	960.560	1.004	960.560	0.858
* 9. Workmans Compensation Ins.	1,800.000	1.882	1,800.000	1.608
* 10. Black Lung Comp. Ins.	2,000.000	2.091	2,000.000	1.786
* 11. Welfare - Hourly	1,000.000	1.046	940.000	0.840
12. Welfare - Tonnage	0.000	0.000	0.000	0.000
* 13. Safety Expenses	250.000	0.261	250.000	0.223
* 14. Production & Safety Incentives	300.000	0.314	300.000	0.268
* 15. Accident Costs	300.000	0.314	300.000	0.268
16. Reclamation Fee	143.455	0.150	167.929	0.150
17. Federal Black Lung Fee	1,052.006	1.100	1,231.482	1.100
* 18. Other Costs	0.000	0.000	0.000	0.000
Total	28,420.635	29.717	28,380.620	25.350
B. Other Cash Costs				
* 1. Overhead	300.000	0.314	300.000	0.268
2. Royalties	605.382	0.633	708.662	0.633
3. Miscellaneous Taxes	0.000	0.000	0.000	0.000
* 4. Equipment Leasing Costs	600.000	0.627	600.000	0.536
* 5. Interest Expense	500.000	0.523	525.000	0.469
* 6. Miscellaneous Income	0.000	0.000	0.000	0.000
Total	2,005.382	2.097	2,133.662	1.906
C. Other Costs				
* 1. Depreciation	600.000	0.627	635.714	0.568
2. Amortization of Development Costs	0.000	0.000	0.000	0.000
3. Depletion	0.000	0.000	0.000	0.000
Total	600.000	0.627	635.714	0.568
Total Cost of Mining	31,026.016	32.441	31,149.995	27.824

* Fixed Dollars Per Year

MINE PRODUCTION MODEL BY CONTINUOUS MINER SECTION
IMPROVED UPTIME BY 40 MINUTES

ITEM IDENTIFICATION	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	TOTAL/AVG
Minutes Per Shift	480.0	480.0	480.0	480.0	480.0	480.0	480.0
Travel Time	60.0	62.0	65.0	58.0	62.0	64.0	61.7
Lunch Time	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Service Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Operating Time	390.0	388.0	385.0	392.0	388.0	386.0	388.3
Downtime							
Miner	12.8	15.0	8.0	19.4	0.0	20.0	12.9
S.C.	5.0	0.2	2.0	5.5	2.0	8.2	3.7
Belt	11.0	12.2	18.0	8.5	11.0	9.5	11.9
Bolter	4.8	5.0	6.0	5.9	8.0	4.6	5.7
Feeder	3.0	3.8	4.2	3.6	5.0	6.8	4.3
C/PTM	30.5	31.0	22.0	28.8	35.0	38.0	30.2
Power	1.8	1.0	2.0	2.5	2.8	1.9	2.0
Timber & Rail	2.0	2.9	3.0	5.0	5.3	3.0	3.5
Conditions	5.0	5.8	6.0	2.5	4.2	2.8	4.5
Safety	8.0	5.5	6.8	10.0	7.0	5.1	7.2
Model Adjust Delays	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Downtime	83.9	82.4	78.0	91.7	80.3	99.9	85.7
Remaining Uptime	306.1	305.6	307.0	300.3	307.7	286.1	302.6
Unit Shifts/Year	502	480	536	528	354	380	2780
Cubic Feet/Place	1710.7	1731.7	1857.4	1880.0	1642.8	1409.4	1724.9
Density	94.50	94.50	94.50	94.50	94.50	94.50	94.50
Raw Tons/Place	80.8	81.8	87.8	88.8	77.6	66.6	81.5
Raw Tons/S.C.	7.0	7.0	7.0	7.0	7.0	7.0	7.0
No. S.C./Place	11.5	11.7	12.5	12.7	11.1	9.5	11.6
Reject %	22.80	22.80	22.80	22.80	22.80	22.80	22.80
Clean Tons/S.C.	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Place Time							
Mining	15.01	15.20	16.30	16.50	14.42	12.37	15.14
Maneuvering	3.46	3.51	3.76	3.81	3.33	2.58	3.46
S.C. Change	17.60	17.60	21.60	15.60	13.20	15.30	17.12
Gas Test & Safety	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ventilation & Posts	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Tram	3.48	3.60	3.66	3.30	3.00	3.75	3.48
Total Place Time	46.15	46.51	51.92	45.81	40.55	40.60	45.79
Roof Bolting Place Time	38.80	40.20	39.50	38.75	36.80	37.00	38.67
Places/Unit Shift	6.632	6.571	5.913	6.556	7.589	7.047	6.70
Productivity - Clean Coal							
Tons/Unit Shift	413.9	415.1	400.6	449.6	454.8	362.3	416.5
Tons/Hour	81.1	81.5	78.3	89.8	88.7	76.0	82.6
Tons/Minute	1.352	1.358	1.305	1.497	1.478	1.266	1.376
Annual Production, st	207,768	199,239	214,739	237,375	160,984	137,675	1,157,779

Cost of Mining Statement
Base Year 1992

Basis of Estimates	Adj. Time St. Data		Uptime by 40 Minutes	
Days of Operation	240		240	
Total Production (Clean st) (000)	956.369		1,157.779	
Daily Production (Clean st)	3,985		4,824	
Approx. st/worker-day	18.113		23.193	

Cost basis	Dollars(000)	\$/st	Dollars(000)	\$/st
A. Direct Operating Costs				
* 1. Labor - Salaried	1,575.000	1.647	1,575.000	1.360
* 2. Labor - Hourly	7,104.000	7.428	6,677.760	5.768
* 3. Benefits - Salaried	473.000	0.495	473.000	0.409
* 4. Benefits - Hourly	2,842.000	2.972	2,671.480	2.307
* 5. Supplies - Operating	2,419.614	2.530	2,929.181	2.530
* 6. Supplies - Maintenance	5,001.000	5.229	5,001.000	4.319
* 7. Power	1,200.000	1.255	1,200.000	1.036
* 8. FICA & Unemployment Taxes	960.560	1.004	960.560	0.830
* 9. Workmans Compensation Ins.	1,800.000	1.882	1,800.000	1.555
* 10. Black Lung Comp. Ins.	2,000.000	2.091	2,000.000	1.727
* 11. Welfare - Hourly	1,000.000	1.046	940.000	0.812
* 12. Welfare - Tonnage	0.000	0.000	0.000	0.000
* 13. Safety Expenses	250.000	0.261	250.000	0.216
* 14. Production & Safety Incentives	300.000	0.314	300.000	0.259
* 15. Accident Costs	300.000	0.314	300.000	0.259
* 16. Reclamation Fee	143.455	0.150	173.667	0.150
* 17. Federal Black Lung Fee	1,052.006	1.100	1,273.557	1.100
* 18. Other Costs	0.000	0.000	0.000	0.000
Total	28,420.635	29.717	28,525.205	24.638
B. Other Cash Costs				
* 1. Overhead	300.000	0.314	300.000	0.259
* 2. Royalties	605.382	0.633	732.874	0.633
* 3. Miscellaneous Taxes	0.000	0.000	0.000	0.000
* 4. Equipment Leasing Costs	600.000	0.627	600.000	0.518
* 5. Interest Expense	500.000	0.523	525.000	0.453
* 6. Miscellaneous Income	0.000	0.000	0.000	0.000
Total	2,005.382	2.097	2,157.874	1.864
C. Other Costs				
* 1. Depreciation	600.000	0.627	635.714	0.549
* 2. Amortization of Development Costs	0.000	0.000	0.000	0.000
* 3. Depletion	0.000	0.000	0.000	0.000
Total	600.000	0.627	635.714	0.549
Total Cost of Mining	31,026.016	32.441	31,318.793	27.051

* Fixed Dollars Per Year

MINE PRODUCTION MODEL BY CONTINUOUS MINER SECTION
IMPROVED UPTIME BY 50 MINUTES

ITEM IDENTIFICATION	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	TOTAL/AVG
Minutes Per Shift	480.0	480.0	480.0	480.0	480.0	480.0	480.0
Travel Time	60.0	62.0	65.0	58.0	62.0	64.0	61.7
Lunch Time	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Service Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Operating Time	390.0	388.0	385.0	392.0	388.0	386.0	388.3
Downtime							
Miner	12.8	15.0	8.0	19.4	0.0	20.0	12.9
S.C.	5.0	0.2	2.0	5.5	2.0	8.2	3.7
Belt	6.0	7.2	13.0	3.5	6.0	4.5	6.9
Bolter	4.8	5.0	6.0	5.9	8.0	4.6	5.7
Feeder	3.0	3.8	4.2	3.6	5.0	6.8	4.3
C/PTM	30.5	31.0	22.0	28.8	35.0	38.0	30.2
Power	1.8	1.0	2.0	2.5	2.8	1.9	2.0
Timber & Rail	2.0	2.9	3.0	5.0	5.3	3.0	3.5
Conditions	5.0	5.8	6.0	2.5	4.2	2.8	4.5
Safety	3.0	0.5	1.8	5.0	2.0	0.1	2.2
Model Adjust Delays	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Downtime	73.9	72.4	68.0	81.7	70.3	89.9	75.7
Remaining Uptime	316.1	315.6	317.0	310.3	317.7	296.1	312.6
Unit Shifts/Year	502	480	536	528	354	380	2780
Cubic Feet/Place	1710.7	1731.7	1857.4	1880.0	1642.8	1409.4	1724.9
Density	94.50	94.50	94.50	94.50	94.50	94.50	94.50
Raw Tons/Place	80.8	81.8	87.8	88.8	77.6	66.6	81.5
Raw Tons/S.C.	7.0	7.0	7.0	7.0	7.0	7.0	7.0
No. S.C./Place	11.5	11.7	12.5	12.7	11.1	9.5	11.6
Reject %	22.80	22.80	22.80	22.80	22.80	22.80	22.80
Clean Tons/S.C.	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Place Time							
Mining	15.01	15.20	16.30	16.50	14.42	12.37	15.14
Maneuvering	3.46	3.51	3.76	3.81	3.33	2.58	3.46
S.C. Change	17.60	17.60	21.60	15.60	13.20	15.30	17.12
Gas Test & Safety	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ventilation & Posts	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Tram	3.48	3.60	3.66	3.30	3.00	3.75	3.48
Total Place Time	46.15	46.51	51.92	45.81	40.55	40.60	45.79
Roof Bolting Place Time	38.80	40.20	39.50	38.75	36.80	37.00	38.67
Places/Unit Shift	6.849	6.786	6.106	6.774	7.836	7.294	6.92
Productivity - Clean Coal							
Tons/Unit Shift	427.4	428.7	413.7	464.5	469.5	375.0	430.2
Tons/Hour	81.1	81.5	78.3	89.8	88.7	76.0	82.6
Tons/Minute	1.352	1.358	1.305	1.497	1.478	1.266	1.376
Annual Production, st	214,556	205,758	221,734	245,279	166,216	142,487	1,196,030

Cost of Mining Statement
Base Year 1992

Basis of Estimates	Adj. Time St. Data	Uptime by 50 Minutes
Days of Operation	240	240
Total Production (Clean st) (000)	956.369	1,196.030
Daily Production (Clean st)	3,985	4,983
Approx. st/worker-day	18.113	23.959

Cost basis	Dollars (000)	\$/st	Dollars (000)	\$/st
A. Direct Operating Costs				
* 1. Labor - Salaried	1,575.000	1.647	1,575.000	1.317
* 2. Labor - Hourly	7,104.000	7.428	6,677.760	5.583
* 3. Benefits - Salaried	473.000	0.495	473.000	0.395
* 4. Benefits - Hourly	2,842.000	2.972	2,671.480	2.234
5. Supplies - Operating	2,419.614	2.530	3,025.956	2.530
* 6. Supplies - Maintenance	5,001.000	5.229	5,001.000	4.181
* 7. Power	1,200.000	1.255	1,200.000	1.003
* 8. FICA & Unemployment Taxes	960.560	1.004	960.560	0.803
* 9. Workmans Compensation Ins.	1,800.000	1.882	1,800.000	1.505
* 10. Black Lung Comp. Ins.	2,000.000	2.091	2,000.000	1.672
* 11. Welfare - Hourly	1,000.000	1.046	940.000	0.786
12. Welfare - Tonnage	0.000	0.000	0.000	0.000
* 13. Safety Expenses	250.000	0.261	250.000	0.209
* 14. Production & Safety Incentives	300.000	0.314	300.000	0.251
* 15. Accident Costs	300.000	0.314	300.000	0.251
16. Reclamation Fee	143.455	0.150	179.405	0.150
17. Federal Black Lung Fee	1,052.006	1.100	1,315.633	1.100
* 18. Other Costs	0.000	0.000	0.000	0.000
Total	28,420.635	29.717	28,669.793	23.971
B. Other Cash Costs				
* 1. Overhead	300.000	0.314	300.000	0.251
2. Royalties	605.382	0.633	757.087	0.633
3. Miscellaneous Taxes	0.000	0.000	0.000	0.000
* 4. Equipment Leasing Costs	600.000	0.627	600.000	0.502
* 5. Interest Expense	500.000	0.523	525.000	0.439
* 6. Miscellaneous Income	0.000	0.000	0.000	0.000
Total	2,005.382	2.097	2,182.087	1.824
C. Other Costs				
* 1. Depreciation	600.000	0.627	635.714	0.532
2. Amortization of Development Costs	0.000	0.000	0.000	0.000
3. Depletion	0.000	0.000	0.000	0.000
Total	600.000	0.627	635.714	0.532
Total Cost of Mining	31,026.016	32.441	31,487.594	26.327

* Fixed Dollars Per Year

MINE PRODUCTION MODEL BY CONTINUOUS MINER SECTION
IMPROVED UPTIME BY 30 MINUTES FOR 25% EFFICIENCY

ITEM IDENTIFICATION	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	TOTAL/AVG
Minutes Per Shift	480.0	480.0	480.0	480.0	480.0	480.0	480.0
Travel Time	60.0	62.0	65.0	58.0	62.0	64.0	61.7
Lunch Time	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Service Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Operating Time	390.0	388.0	385.0	392.0	388.0	386.0	388.3
Downtime							
Miner	12.8	15.0	8.0	19.4	0.0	20.0	12.9
S.C.	5.0	0.2	2.0	5.5	2.0	8.2	3.7
Belt	11.0	12.2	18.0	8.5	11.0	9.5	11.9
Bolter	4.8	5.0	6.0	5.9	8.0	4.6	5.7
Feeder	3.0	3.8	4.2	3.6	5.0	6.8	4.3
C/PTM	30.5	31.0	22.0	28.8	35.0	38.0	30.2
Power	1.8	1.0	2.0	2.5	2.8	1.9	2.0
Timber & Rail	2.0	2.9	3.0	5.0	5.3	3.0	3.5
Conditions	5.0	5.8	6.0	2.5	4.2	2.8	4.5
Safety	18.0	15.5	16.8	20.0	17.0	15.1	17.2
Model Adjust Delays	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Downtime	93.9	92.4	88.0	101.7	90.3	109.9	95.7
Remaining Uptime	296.1	295.6	297.0	290.3	297.7	276.1	292.6
Unit Shifts/Year	502	480	536	528	354	380	2780
Cubic Feet/Place	1710.7	1731.7	1857.4	1880.0	1642.8	1409.4	1724.9
Density	94.50	94.50	94.50	94.50	94.50	94.50	94.50
Raw Tons/Place	80.8	81.8	87.8	88.8	77.6	66.6	81.5
Raw Tons/S.C.	7.0	7.0	7.0	7.0	7.0	7.0	7.0
No. S.C./Place	11.5	11.7	12.5	12.7	11.1	9.5	11.6
Reject %	22.80	22.80	22.80	22.80	22.80	22.80	22.80
Clean Tons/S.C.	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Place Time							
Mining	12.01	12.16	13.04	13.20	11.53	9.89	12.11
Maneuvering	3.46	3.51	3.76	3.81	3.33	2.58	3.46
S.C. Change	17.60	17.60	21.60	15.60	13.20	15.30	17.12
Gas Test & Safety	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ventilation & Posts	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Tram	3.48	3.60	3.66	3.30	3.00	3.75	3.48
Total Place Time	43.15	43.47	48.66	42.51	37.66	38.12	42.76
Roof Bolting Place Time	38.80	40.20	39.50	38.75	36.80	37.00	38.67
Places/Unit Shift	6.862	6.801	6.104	6.829	7.904	7.242	6.94
Productivity - Clean Coal							
Tons/Unit Shift	428.2	429.6	413.5	468.3	473.7	372.3	431.4
Tons/Hour	86.8	87.2	83.5	96.8	95.5	80.9	88.4
Tons/Minute	1.446	1.453	1.392	1.613	1.591	1.349	1.474
Annual Production, st	214,965	206,194	221,661	247,281	167,675	141,483	1,199,259

Cost of Mining Statement
Base Year 1992

Basis of Estimates	Adj. Time St. Data	Uptime by 30 Minutes For 25% Efficiency
Days of Operation	240	240
Total Production (Clean st) (000)	956.369	1,199.259
Daily Production (Clean st)	3,985	4,997
Approx. st/worker-day	18.113	24.024

Cost basis	Dollars(000)	\$/st	Dollars(000)	\$/st
A. Direct Operating Costs				
* 1. Labor - Salaried	1,575.000	1.647	1,575.000	1.313
* 2. Labor - Hourly	7,104.000	7.428	6,677.760	5.568
* 3. Benefits - Salaried	473.000	0.495	473.000	0.394
* 4. Benefits - Hourly	2,842.000	2.972	2,671.480	2.228
5. Supplies - Operating	2,419.614	2.530	3,034.125	2.530
* 6. Supplies - Maintenance	5,001.000	5.229	5,001.000	4.170
* 7. Power	1,200.000	1.255	1,200.000	1.001
* 8. FICA & Unemployment Taxes	960.560	1.004	960.560	0.801
* 9. Workmans Compensation Ins.	1,800.000	1.882	1,800.000	1.501
* 10. Black Lung Comp. Ins.	2,000.000	2.091	2,000.000	1.668
* 11. Welfare - Hourly	1,000.000	1.046	940.000	0.784
12. Welfare - Tonnage	0.000	0.000	0.000	0.000
* 13. Safety Expenses	250.000	0.261	250.000	0.208
* 14. Production & Safety Incentives	300.000	0.314	300.000	0.250
* 15. Accident Costs	300.000	0.314	300.000	0.250
16. Reclamation Fee	143.455	0.150	179.889	0.150
17. Federal Black Lung Fee	1,052.006	1.100	1,319.185	1.100
* 18. Other Costs	0.000	0.000	0.000	0.000
Total	28,420.635	29.717	28,681.999	23.916
B. Other Cash Costs				
* 1. Overhead	300.000	0.314	300.000	0.250
2. Royalties	605.382	0.633	759.131	0.633
3. Miscellaneous Taxes	0.000	0.000	0.000	0.000
* 4. Equipment Leasing Costs	600.000	0.627	600.000	0.500
* 5. Interest Expense	500.000	0.523	525.000	0.438
* 6. Miscellaneous Income	0.000	0.000	0.000	0.000
Total	2,005.382	2.097	2,184.131	1.821
C. Other Costs				
* 1. Depreciation	600.000	0.627	635.714	0.530
2. Amortization of Development Costs	0.000	0.000	0.000	0.000
3. Depletion	0.000	0.000	0.000	0.000
Total	600.000	0.627	635.714	0.530
Total Cost of Mining	31,026.016	32.441	31,501.844	26.268

* Fixed Dollars Per Year

MINE PRODUCTION MODEL BY CONTINUOUS MINER SECTION
IMPROVED UPTIME BY 40 MINUTES FOR 25% EFFICIENCY

ITEM IDENTIFICATION	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	TOTAL/AVG
Minutes Per Shift	480.0	480.0	480.0	480.0	480.0	480.0	480.0
Travel Time	60.0	62.0	65.0	58.0	62.0	64.0	61.7
Lunch Time	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Service Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Operating Time	390.0	388.0	385.0	392.0	388.0	386.0	388.3
Downtime							
Miner	12.8	15.0	8.0	19.4	0.0	20.0	12.9
S.C.	5.0	0.2	2.0	5.5	2.0	8.2	3.7
Belt	11.0	12.2	18.0	8.5	11.0	9.5	11.9
Bolter	4.8	5.0	6.0	5.9	8.0	4.6	5.7
Feeder	3.0	3.8	4.2	3.6	5.0	6.8	4.3
C/PTM	30.5	31.0	22.0	28.8	35.0	38.0	30.2
Power	1.8	1.0	2.0	2.5	2.8	1.9	2.0
Timber & Rail	2.0	2.9	3.0	5.0	5.3	3.0	3.5
Conditions	5.0	5.8	6.0	2.5	4.2	2.8	4.5
Safety	8.0	5.5	6.8	10.0	7.0	5.1	7.2
Model Adjust Delays	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Downtime	83.9	82.4	78.0	91.7	80.3	99.9	85.7
Remaining Uptime	306.1	305.6	307.0	300.3	307.7	286.1	302.6
Unit Shifts/Year	502	480	536	528	354	380	2780
Cubic Feet/Place	1710.7	1731.7	1857.4	1880.0	1642.8	1409.4	1724.9
Density	94.50	94.50	94.50	94.50	94.50	94.50	94.50
Raw Tons/Place	80.8	81.8	87.8	88.8	77.6	66.6	81.5
Raw Tons/S.C.	7.0	7.0	7.0	7.0	7.0	7.0	7.0
No. S.C./Place	11.5	11.7	12.5	12.7	11.1	9.5	11.6
Reject %	22.80	22.80	22.80	22.80	22.80	22.80	22.80
Clean Tons/S.C.	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Place Time							
Mining	12.01	12.16	13.04	13.20	11.53	9.89	12.11
Maneuvering	3.46	3.51	3.76	3.81	3.33	2.58	3.46
S.C. Change	17.60	17.60	21.60	15.60	13.20	15.30	17.12
Gas Test & Safety	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ventilation & Posts	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Tram	3.48	3.60	3.66	3.30	3.00	3.75	3.48
Total Place Time	43.15	43.47	48.66	42.51	37.66	38.12	42.76
Roof Bolting Place Time	38.80	40.20	39.50	38.75	36.80	37.00	38.67
Places/Unit Shift	7.094	7.031	6.309	7.065	8.170	7.504	7.17
Productivity - Clean Coal							
Tons/Unit Shift	442.7	444.1	427.5	484.5	489.6	385.8	446.1
Tons/Hour	86.8	87.2	83.5	96.8	95.5	80.9	88.4
Tons/Minute	1.446	1.453	1.392	1.613	1.591	1.349	1.474
Annual Production, st	222,224	213,169	229,125	255,799	173,307	146,608	1,240,233

Cost of Mining Statement
Base Year 1992

Basis of Estimates	Adj. Time St. Data	Uptime by 40 Minutes For 25% Efficiency
Days of Operation	240	240
Total Production (Clean st) (000)	956.369	1,240.233
Daily Production (Clean st)	3.985	5,168
Approx. st/worker-day	18.113	24.844

Cost basis	Dollars(000)	\$/st	Dollars(000)	\$/st
A. Direct Operating Costs				
* 1. Labor - Salaried	1,575.000	1.647	1,575.000	1.270
* 2. Labor - Hourly	7,104.000	7.428	6,677.760	5.384
* 3. Benefits - Salaried	473.000	0.495	473.000	0.381
* 4. Benefits - Hourly	2,842.000	2.972	2,671.480	2.154
5. Supplies - Operating	2,419.614	2.530	3,137.789	2.530
* 6. Supplies - Maintenance	5,001.000	5.229	5,001.000	4.032
* 7. Power	1,200.000	1.255	1,200.000	0.968
* 8. FICA & Unemployment Taxes	960.560	1.004	960.560	0.774
* 9. Workmans Compensation Ins.	1,800.000	1.882	1,800.000	1.451
* 10. Black Lung Comp. Ins.	2,000.000	2.091	2,000.000	1.613
* 11. Welfare - Hourly	1,000.000	1.046	940.000	0.758
12. Welfare - Tonnage	0.000	0.000	0.000	0.000
* 13. Safety Expenses	250.000	0.261	250.000	0.202
* 14. Production & Safety Incentives	300.000	0.314	300.000	0.242
* 15. Accident Costs	300.000	0.314	300.000	0.242
16. Reclamation Fee	143.455	0.150	186.035	0.150
17. Federal Black Lung Fee	1,052.006	1.100	1,364.256	1.100
* 18. Other Costs	0.000	0.000	0.000	0.000
Total	28,420.635	29.717	28,836.881	23.251
B. Other Cash Costs				
* 1. Overhead	300.000	0.314	300.000	0.242
2. Royalties	605.382	0.633	785.067	0.633
3. Miscellaneous Taxes	0.000	0.000	0.000	0.000
* 4. Equipment Leasing Costs	600.000	0.627	600.000	0.484
* 5. Interest Expense	500.000	0.523	525.000	0.423
* 6. Miscellaneous Income	0.000	0.000	0.000	0.000
Total	2,005.382	2.097	2,210.067	1.782
C. Other Costs				
* 1. Depreciation	600.000	0.627	635.714	0.513
2. Amortization of Development Costs	0.000	0.000	0.000	0.000
3. Depletion	0.000	0.000	0.000	0.000
Total	600.000	0.627	635.714	0.513
Total Cost of Mining	31,026.016	32.441	31,682.662	25.546

* Fixed Dollars Per Year

MINE PRODUCTION MODEL BY CONTINUOUS MINER SECTION
IMPROVED UPTIME BY 50 MINUTES FOR 25% EFFICIENCY

ITEM IDENTIFICATION	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	TOTAL/AVG
Minutes Per Shift	480.0	480.0	480.0	480.0	480.0	480.0	480.0
Travel Time	60.0	62.0	65.0	58.0	62.0	64.0	61.7
Lunch Time	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Service Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Operating Time	390.0	388.0	385.0	392.0	388.0	386.0	388.3
Downtime							
Miner	12.8	15.0	8.0	19.4	0.0	20.0	12.9
S.C.	5.0	0.2	2.0	5.5	2.0	8.2	3.7
Belt	6.0	7.2	13.0	3.5	6.0	4.5	6.9
Bolter	4.8	5.0	6.0	5.9	8.0	4.6	5.7
Feeder	3.0	3.8	4.2	3.6	5.0	6.8	4.3
C/PTM	30.5	31.0	22.0	28.8	35.0	38.0	30.2
Power	1.8	1.0	2.0	2.5	2.8	1.9	2.0
Timber & Rail	2.0	2.9	3.0	5.0	5.3	3.0	3.5
Conditions	5.0	5.8	6.0	2.5	4.2	2.8	4.5
Safety	3.0	0.5	1.8	5.0	2.0	0.1	2.2
Model Adjust Delays	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Downtime	73.9	72.4	68.0	81.7	70.3	89.9	75.7
Remaining Uptime	316.1	315.6	317.0	310.3	317.7	296.1	312.6
Unit Shifts/Year	502	480	536	528	354	380	2780
Cubic Feet/Place	1710.7	1731.7	1857.4	1880.0	1642.8	1409.4	1724.9
Density	94.50	94.50	94.50	94.50	94.50	94.50	94.50
Raw Tons/Place	80.8	81.8	87.8	88.8	77.6	66.6	81.5
Raw Tons/S.C.	7.0	7.0	7.0	7.0	7.0	7.0	7.0
No. S.C./Place	11.5	11.7	12.5	12.7	11.1	9.5	11.6
Reject %	22.80	22.80	22.80	22.80	22.80	22.80	22.80
Clean Tons/S.C.	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Place Time							
Mining	12.01	12.16	13.04	13.20	11.53	9.89	12.11
Maneuvering	3.46	3.51	3.76	3.81	3.33	2.58	3.46
S.C. Change	17.60	17.60	21.60	15.60	13.20	15.30	17.12
Gas Test & Safety	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ventilation & Posts	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Tram	3.48	3.60	3.66	3.30	3.00	3.75	3.48
Total Place Time	43.15	43.47	48.66	42.51	37.66	38.12	42.76
Roof Bolting Place Time	38.80	40.20	39.50	38.75	36.80	37.00	38.67
Places/Unit Shift	7.326	7.261	6.515	7.300	8.436	7.767	7.41
Productivity - Clean Coal							
Tons/Unit Shift	457.1	458.6	441.4	500.6	505.5	399.3	460.9
Tons/Hour	86.8	87.2	83.5	96.8	95.5	80.9	88.4
Tons/Minute	1.446	1.453	1.392	1.613	1.591	1.349	1.474
Annual Production, st	229,484	220,144	236,588	264,318	178,940	151,732	1,281,206

Cost of Mining Statement
Base Year 1992

Basis of Estimates	Adj. Time St. Data	Uptime by 50 Minutes For 25% Efficiency
Days of Operation	240	240
Total Production (Clean st) (000)	956.369	1,281.206
Daily Production (Clean st)	3,985	5,338
Approx. st/worker-day	18.113	25.665

Cost basis	Dollars(000)	\$/st	Dollars(000)	\$/st
A. Direct Operating Costs				
* 1. Labor - Salaried	1,575.000	1.647	1,575.000	1.229
* 2. Labor - Hourly	7,104.000	7.428	6,677.760	5.212
* 3. Benefits - Salaried	473.000	0.495	473.000	0.369
* 4. Benefits - Hourly	2,842.000	2.972	2,671.480	2.085
5. Supplies - Operating	2,419.614	2.530	3,241.451	2.530
* 6. Supplies - Maintenance	5,001.000	5.229	5,001.000	3.903
* 7. Power	1,200.000	1.255	1,200.000	0.937
* 8. FICA & Unemployment Taxes	960.560	1.004	960.560	0.750
* 9. Workmans Compensation Ins.	1,800.000	1.882	1,800.000	1.405
* 10. Black Lung Comp. Ins.	2,000.000	2.091	2,000.000	1.561
* 11. Welfare - Hourly	1,000.000	1.046	940.000	0.734
12. Welfare - Tonnage	0.000	0.000	0.000	0.000
* 13. Safety Expenses	250.000	0.261	250.000	0.195
* 14. Production & Safety Incentives	300.000	0.314	300.000	0.234
* 15. Accident Costs	300.000	0.314	300.000	0.234
16. Reclamation Fee	143.455	0.150	192.181	0.150
17. Federal Black Lung Fee	1,052.006	1.100	1,409.327	1.100
* 18. Other Costs	0.000	0.000	0.000	0.000
Total	28,420.635	29.717	28,991.759	22.628
B. Other Cash Costs				
* 1. Overhead	300.000	0.314	300.000	0.234
2. Royalties	605.382	0.633	811.003	0.633
3. Miscellaneous Taxes	0.000	0.000	0.000	0.000
* 4. Equipment Leasing Costs	600.000	0.627	600.000	0.468
* 5. Interest Expense	500.000	0.523	525.000	0.410
* 6. Miscellaneous Income	0.000	0.000	0.000	0.000
Total	2,005.382	2.097	2,236.003	1.745
C. Other Costs				
* 1. Depreciation	600.000	0.627	635.714	0.496
2. Amortization of Development Costs	0.000	0.000	0.000	0.000
3. Depletion	0.000	0.000	0.000	0.000
Total	600.000	0.627	635.714	0.496
Total Cost of Mining	31,026.016	32.441	31,863.476	24.870

* Fixed Dollars Per Year

MINE PRODUCTION MODEL BY CONTINUOUS MINER SECTION
IMPROVED UPTIME BY 30 MINUTES FOR 50% EFFICIENCY

ITEM IDENTIFICATION	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	TOTAL/AVG
Minutes Per Shift	480.0	480.0	480.0	480.0	480.0	480.0	480.0
Travel Time	60.0	62.0	65.0	58.0	62.0	64.0	61.7
Lunch Time	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Service Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Operating Time	390.0	388.0	385.0	392.0	388.0	386.0	388.3
Downtime							
Miner	12.8	15.0	8.0	19.4	0.0	20.0	12.9
S.C.	5.0	0.2	2.0	5.5	2.0	8.2	3.7
Belt	11.0	12.2	18.0	8.5	11.0	9.5	11.9
Bolter	4.8	5.0	6.0	5.9	8.0	4.6	5.7
Feeder	3.0	3.8	4.2	3.6	5.0	6.8	4.3
C/PTM	30.5	31.0	22.0	28.8	35.0	38.0	30.2
Power	1.8	1.0	2.0	2.5	2.8	1.9	2.0
Timber & Rail	2.0	2.9	3.0	5.0	5.3	3.0	3.5
Conditions	5.0	5.8	6.0	2.5	4.2	2.8	4.5
Safety	18.0	15.5	16.8	20.0	17.0	15.1	17.2
Model Adjust Delays	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Downtime	93.9	92.4	88.0	101.7	90.3	109.9	95.7
Remaining Uptime	296.1	295.6	297.0	290.3	297.7	276.1	292.6
Unit Shifts/Year	502	480	536	528	354	380	2780
Cubic Feet/Place	1710.7	1731.7	1857.4	1880.0	1642.8	1409.4	1724.9
Density	94.50	94.50	94.50	94.50	94.50	94.50	94.50
Raw Tons/Place	80.8	81.8	87.8	88.8	77.6	66.6	81.5
Raw Tons/S.C.	7.0	7.0	7.0	7.0	7.0	7.0	7.0
No. S.C./Place	11.5	11.7	12.5	12.7	11.1	9.5	11.6
Reject %	22.80	22.80	22.80	22.80	22.80	22.80	22.80
Clean Tons/S.C.	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Place Time							
Mining	10.05	10.17	10.91	11.04	9.65	8.28	10.13
Maneuvering	3.46	3.51	3.76	3.81	3.33	2.58	3.46
S.C. Change	17.60	17.60	21.60	15.60	13.20	15.30	17.12
Gas Test & Safety	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ventilation & Posts	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Tram	3.48	3.60	3.66	3.30	3.00	3.75	3.48
Total Place Time	41.19	41.48	46.53	40.35	35.78	36.51	40.78
Roof Bolting Place Time	38.80	40.20	39.50	38.75	36.80	37.00	38.67
Places/Unit Shift	7.189	7.126	6.383	7.194	8.090	7.462	7.23
Productivity - Clean Coal							
Tons/Unit Shift	448.6	450.1	432.5	493.4	484.8	383.6	450.0
Tons/Hour	90.9	91.4	87.4	102.0	97.7	83.4	92.2
Tons/Minute	1.515	1.523	1.456	1.700	1.628	1.389	1.537
Annual Production, st	225,210	216,071	231,816	260,502	171,603	145,781	1,250,984

Cost of Mining Statement
Base Year 1992

Basis of Estimates	Adj. Time St. Data	Uptime by 30 Minutes For 50% Efficiency
Days of Operation	240	240
Total Production (Clean st) (000)	956.369	1,250.984
Daily Production (Clean st)	3,985	5,212
Approx. st/worker-day	18.113	25.060

Cost basis	Dollars(000)	\$/st	Dollars(000)	\$/st
A. Direct Operating Costs				
* 1. Labor - Salaried	1,575.000	1.647	1,575.000	1.259
* 2. Labor - Hourly	7,104.000	7.428	6,677.760	5.338
* 3. Benefits - Salaried	473.000	0.495	473.000	0.378
* 4. Benefits - Hourly	2,842.000	2.972	2,671.480	2.136
* 5. Supplies - Operating	2,419.614	2.530	3,164.990	2.530
* 6. Supplies - Maintenance	5,001.000	5.229	5,001.000	3.998
* 7. Power	1,200.000	1.255	1,200.000	0.959
* 8. FICA & Unemployment Taxes	960.560	1.004	960.560	0.768
* 9. Workmans Compensation Ins.	1,800.000	1.882	1,800.000	1.439
* 10. Black Lung Comp. Ins.	2,000.000	2.091	2,000.000	1.599
* 11. Welfare - Hourly	1,000.000	1.046	940.000	0.751
* 12. Welfare - Tonnage	0.000	0.000	0.000	0.000
* 13. Safety Expenses	250.000	0.261	250.000	0.200
* 14. Production & Safety Incentives	300.000	0.314	300.000	0.240
* 15. Accident Costs	300.000	0.314	300.000	0.240
* 16. Reclamation Fee	143.455	0.150	187.648	0.150
* 17. Federal Black Lung Fee	1,052.006	1.100	1,376.082	1.100
* 18. Other Costs	0.000	0.000	0.000	0.000
Total	28,420.635	29.717	28,877.520	23.084
B. Other Cash Costs				
* 1. Overhead	300.000	0.314	300.000	0.240
* 2. Royalties	605.382	0.633	791.873	0.633
* 3. Miscellaneous Taxes	0.000	0.000	0.000	0.000
* 4. Equipment Leasing Costs	600.000	0.627	600.000	0.480
* 5. Interest Expense	500.000	0.523	525.000	0.420
* 6. Miscellaneous Income	0.000	0.000	0.000	0.000
Total	2,005.382	2.097	2,216.873	1.772
C. Other Costs				
* 1. Depreciation	600.000	0.627	635.714	0.508
* 2. Amortization of Development Costs	0.000	0.000	0.000	0.000
* 3. Depletion	0.000	0.000	0.000	0.000
Total	600.000	0.627	635.714	0.508
Total Cost of Mining	31,026.016	32.441	31,730.106	25.364

* Fixed Dollars Per Year

MINE PRODUCTION MODEL BY CONTINUOUS MINER SECTION
IMPROVED UPTIME BY 40 MINUTES FOR 50% EFFICIENCY

ITEM IDENTIFICATION	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	TOTAL/AVG
Minutes Per Shift	480.0	480.0	480.0	480.0	480.0	480.0	480.0
Travel Time	60.0	62.0	65.0	58.0	62.0	64.0	61.7
Lunch Time	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Service Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Operating Time	390.0	388.0	385.0	392.0	388.0	386.0	388.3
Downtime							
Miner	12.8	15.0	8.0	19.4	0.0	20.0	12.9
S.C.	5.0	0.2	2.0	5.5	2.0	8.2	3.7
Belt	11.0	12.2	18.0	8.5	11.0	9.5	11.9
Bolter	4.8	5.0	6.0	5.9	8.0	4.6	5.7
Feeder	3.0	3.8	4.2	3.6	5.0	6.8	4.3
C/PTM	30.5	31.0	22.0	28.8	35.0	38.0	30.2
Power	1.8	1.0	2.0	2.5	2.8	1.9	2.0
Timber & Rail	2.0	2.9	3.0	5.0	5.3	3.0	3.5
Conditions	5.0	5.8	6.0	2.5	4.2	2.8	4.5
Safety	8.0	5.5	6.8	10.0	7.0	5.1	7.2
Model Adjust Delays	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Downtime	83.9	82.4	78.0	91.7	80.3	99.9	85.7
Remaining Uptime	306.1	305.6	307.0	300.3	307.7	286.1	302.6
Unit Shifts/Year	502	480	536	528	354	380	2780
Cubic Feet/Place	1710.7	1731.7	1857.4	1880.0	1642.8	1409.4	1724.9
Density	94.50	94.50	94.50	94.50	94.50	94.50	94.50
Raw Tons/Place	80.8	81.8	87.8	88.8	77.6	66.6	81.5
Raw Tons/S.C.	7.0	7.0	7.0	7.0	7.0	7.0	7.0
No. S.C./Place	11.5	11.7	12.5	12.7	11.1	9.5	11.6
Reject %	22.80	22.80	22.80	22.80	22.80	22.80	22.80
Clean Tons/S.C.	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Place Time							
Mining	10.05	10.17	10.91	11.04	9.65	8.28	10.13
Maneuvering	3.46	3.51	3.76	3.81	3.33	2.58	3.46
S.C. Change	17.60	17.60	21.60	15.60	13.20	15.30	17.12
Gas Test & Safety	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ventilation & Posts	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Tram	3.48	3.60	3.66	3.30	3.00	3.75	3.48
Total Place Time	41.19	41.48	46.53	40.35	35.78	36.51	40.78
Roof Bolting Place Time	38.80	40.20	39.50	38.75	36.80	37.00	38.67
Places/Unit Shift	7.432	7.368	6.598	7.442	8.361	7.732	7.48
Productivity - Clean Coal							
Tons/Unit Shift	463.8	465.4	447.1	510.4	501.0	397.5	465.4
Tons/Hour	90.9	91.4	87.4	102.0	97.7	83.4	92.2
Tons/Minute	1.515	1.523	1.456	1.700	1.628	1.389	1.537
Annual Production, st	232,816	223,381	239,621	269,476	177,368	151,061	1,293,722

Cost of Mining Statement
Base Year 1992

Basis of Estimates	Adj. Time St. Data	Uptime by 40 Minutes For 50% Efficiency
Days of Operation	240	240
Total Production (Clean st) (000)	956.369	1,293.722
Daily Production (Clean st)	3,985	5,391
Approx. st/worker-day	18.113	25.916

Cost basis	Dollars(000)	\$/st	Dollars(000)	\$/st
A. Direct Operating Costs				
* 1. Labor - Salaried	1,575.000	1.647	1,575.000	1.217
* 2. Labor - Hourly	7,104.000	7.428	6,677.760	5.162
* 3. Benefits - Salaried	473.000	0.495	473.000	0.366
* 4. Benefits - Hourly	2,842.000	2.972	2,671.480	2.065
5. Supplies - Operating	2,419.614	2.530	3,273.117	2.530
* 6. Supplies - Maintenance	5,001.000	5.229	5,001.000	3.866
* 7. Power	1,200.000	1.255	1,200.000	0.928
* 8. FICA & Unemployment Taxes	960.560	1.004	960.560	0.742
* 9. Workmans Compensation Ins.	1,800.000	1.882	1,800.000	1.391
* 10. Black Lung Comp. Ins.	2,000.000	2.091	2,000.000	1.546
* 11. Welfare - Hourly	1,000.000	1.046	940.000	0.727
12. Welfare - Tonnage	0.000	0.000	0.000	0.000
* 13. Safety Expenses	250.000	0.261	250.000	0.193
* 14. Production & Safety Incentives	300.000	0.314	300.000	0.232
* 15. Accident Costs	300.000	0.314	300.000	0.232
16. Reclamation Fee	143.455	0.150	194.058	0.150
17. Federal Black Lung Fee	1,052.006	1.100	1,423.094	1.100
* 18. Other Costs	0.000	0.000	0.000	0.000
Total	28,420.635	29.717	29,039.069	22.446
B. Other Cash Costs				
* 1. Overhead	300.000	0.314	300.000	0.232
2. Royalties	605.382	0.633	818.926	0.633
3. Miscellaneous Taxes	0.000	0.000	0.000	0.000
* 4. Equipment Leasing Costs	600.000	0.627	600.000	0.464
* 5. Interest Expense	500.000	0.523	525.000	0.406
* 6. Miscellaneous Income	0.000	0.000	0.000	0.000
Total	2,005.382	2.097	2,243.926	1.734
C. Other Costs				
* 1. Depreciation	600.000	0.627	635.714	0.491
2. Amortization of Development Costs	0.000	0.000	0.000	0.000
3. Depletion	0.000	0.000	0.000	0.000
Total	600.000	0.627	635.714	0.491
Total Cost of Mining	31,026.016	32.441	31,918.709	24.672

* Fixed Dollars Per Year

MINE PRODUCTION MODEL BY CONTINUOUS MINER SECTION
IMPROVED UPTIME BY 50 MINUTES FOR 50% EFFICIENCY

ITEM IDENTIFICATION	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	TOTAL/AVG
Minutes Per Shift	480.0	480.0	480.0	480.0	480.0	480.0	480.0
Travel Time	60.0	62.0	65.0	58.0	62.0	64.0	61.7
Lunch Time	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Service Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Operating Time	390.0	388.0	385.0	392.0	388.0	386.0	388.3
Downtime							
Miner	12.8	15.0	8.0	19.4	0.0	20.0	12.9
S.C.	5.0	0.2	2.0	5.5	2.0	8.2	3.7
Belt	6.0	7.2	13.0	3.5	6.0	4.5	6.9
Bolter	4.8	5.0	6.0	5.9	8.0	4.6	5.7
Feeder	3.0	3.8	4.2	3.6	5.0	6.8	4.3
C/PTM	30.5	31.0	22.0	28.8	35.0	38.0	30.2
Power	1.8	1.0	2.0	2.5	2.8	1.9	2.0
Timber & Rail	2.0	2.9	3.0	5.0	5.3	3.0	3.5
Conditions	5.0	5.8	6.0	2.5	4.2	2.8	4.5
Safety	3.0	0.5	1.8	5.0	2.0	0.1	2.2
Model Adjust Delays	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Downtime	73.9	72.4	68.0	81.7	70.3	89.9	75.7
Remaining Uptime	316.1	315.6	317.0	310.3	317.7	296.1	312.6
Unit Shifts/Year	502	480	536	528	354	380	2780
Cubic Feet/Place	1710.7	1731.7	1857.4	1880.0	1642.8	1409.4	1724.9
Density	94.50	94.50	94.50	94.50	94.50	94.50	94.50
Raw Tons/Place	80.8	81.8	87.8	88.8	77.6	66.6	81.5
Raw Tons/S.C.	7.0	7.0	7.0	7.0	7.0	7.0	7.0
No. S.C./Place	11.5	11.7	12.5	12.7	11.1	9.5	11.6
Reject %	22.80	22.80	22.80	22.80	22.80	22.80	22.80
Clean Tons/S.C.	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Place Time							
Mining	10.05	10.17	10.91	11.04	9.65	8.28	10.13
Maneuvering	3.46	3.51	3.76	3.81	3.33	2.58	3.46
S.C. Change	17.60	17.60	21.60	15.60	13.20	15.30	17.12
Gas Test & Safety	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ventilation & Posts	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Tram	3.48	3.60	3.66	3.30	3.00	3.75	3.48
Total Place Time	41.19	41.48	46.53	40.35	35.78	36.51	40.78
Roof Bolting Place Time	38.80	40.20	39.50	38.75	36.80	37.00	38.67
Places/Unit Shift	7.675	7.609	6.813	7.690	8.633	8.003	7.73
Productivity - Clean Coal							
Tons/Unit Shift	478.9	480.6	461.6	527.4	517.3	411.4	480.7
Tons/Hour	90.9	91.4	87.4	102.0	97.7	83.4	92.2
Tons/Minute	1.515	1.523	1.456	1.700	1.628	1.389	1.537
Annual Production, st	240,422	230,691	247,426	278,449	183,132	156,341	1,336,461

Cost of Mining Statement
Base Year 1992

Basis of Estimates	Adj. Time St. Data	Uptime by 50 Minutes For 50% Efficiency
Days of Operation	240	240
Total Production (Clean st) (000)	956.369	1,336.461
Daily Production (Clean st)	3,985	5,569
Approx. st/worker-day	18.113	26.772

Cost basis	Dollars(000)	\$/st	Dollars(000)	\$/st
A. Direct Operating Costs				
* 1. Labor - Salaried	1,575.000	1.647	1,575.000	1.178
* 2. Labor - Hourly	7,104.000	7.428	6,677.760	4.997
* 3. Benefits - Salaried	473.000	0.495	473.000	0.354
* 4. Benefits - Hourly	2,842.000	2.972	2,671.480	1.999
5. Supplies - Operating	2,419.614	2.530	3,381.246	2.530
* 6. Supplies - Maintenance	5,001.000	5.229	5,001.000	3.742
* 7. Power	1,200.000	1.255	1,200.000	0.898
* 8. FICA & Unemployment Taxes	960.560	1.004	960.560	0.719
* 9. Workmans Compensation Ins.	1,800.000	1.882	1,800.000	1.347
* 10. Black Lung Comp. Ins.	2,000.000	2.091	2,000.000	1.496
* 11. Welfare - Hourly	1,000.000	1.046	940.000	0.703
12. Welfare - Tonnage	0.000	0.000	0.000	0.000
* 13. Safety Expenses	250.000	0.261	250.000	0.187
* 14. Production & Safety Incentives	300.000	0.314	300.000	0.224
* 15. Accident Costs	300.000	0.314	300.000	0.224
16. Reclamation Fee	143.455	0.150	200.469	0.150
17. Federal Black Lung Fee	1,052.006	1.100	1,470.107	1.100
* 18. Other Costs	0.000	0.000	0.000	0.000
Total	28,420.635	29.717	29,200.623	21.849
B. Other Cash Costs				
* 1. Overhead	300.000	0.314	300.000	0.224
2. Royalties	605.382	0.633	845.980	0.633
3. Miscellaneous Taxes	0.000	0.000	0.000	0.000
* 4. Equipment Leasing Costs	600.000	0.627	600.000	0.449
* 5. Interest Expense	500.000	0.523	525.000	0.393
* 6. Miscellaneous Income	0.000	0.000	0.000	0.000
Total	2,005.382	2.097	2,270.980	1.699
C. Other Costs				
* 1. Depreciation	600.000	0.627	635.714	0.476
2. Amortization of Development Costs	0.000	0.000	0.000	0.000
3. Depletion	0.000	0.000	0.000	0.000
Total	600.000	0.627	635.714	0.476
Total Cost of Mining	31,026.016	32.441	32,107.316	24.024

* Fixed Dollars Per Year

MINE PRODUCTION MODEL BY CONTINUOUS MINER SECTION
IMPROVED UPTIME BY 30 MINUTES FOR 75% EFFICIENCY

ITEM IDENTIFICATION	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	TOTAL/AVG
Minutes Per Shift	480.0	480.0	480.0	480.0	480.0	480.0	480.0
Travel Time	60.0	62.0	65.0	58.0	62.0	64.0	61.7
Lunch Time	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Service Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Operating Time	390.0	388.0	385.0	392.0	388.0	386.0	388.3
Downtime							
Miner	12.8	15.0	8.0	19.4	0.0	20.0	12.9
S.C.	5.0	0.2	2.0	5.5	2.0	8.2	3.7
Belt	11.0	12.2	18.0	8.5	11.0	9.5	11.9
Bolter	4.8	5.0	6.0	5.9	8.0	4.6	5.7
Feeder	3.0	3.8	4.2	3.6	5.0	6.8	4.3
C/PTM	30.5	31.0	22.0	28.8	35.0	38.0	30.2
Power	1.8	1.0	2.0	2.5	2.8	1.9	2.0
Timber & Rail	2.0	2.9	3.0	5.0	5.3	3.0	3.5
Conditions	5.0	5.8	6.0	2.5	4.2	2.8	4.5
Safety	18.0	15.5	16.8	20.0	17.0	15.1	17.2
Model Adjust Delays	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Downtime	93.9	92.4	88.0	101.7	90.3	109.9	95.7
Remaining Uptime	296.1	295.6	297.0	290.3	297.7	276.1	292.6
Unit Shifts/Year	502	480	536	528	354	380	2780
Cubic Feet/Place	1710.7	1731.7	1857.4	1880.0	1642.8	1409.4	1724.9
Density	94.50	94.50	94.50	94.50	94.50	94.50	94.50
Raw Tons/Place	80.8	81.8	87.8	88.8	77.6	66.6	81.5
Raw Tons/S.C.	7.0	7.0	7.0	7.0	7.0	7.0	7.0
No. S.C./Place	11.5	11.7	12.5	12.7	11.1	9.5	11.6
Reject %	22.80	22.80	22.80	22.80	22.80	22.80	22.80
Clean Tons/S.C.	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Place Time							
Mining	8.55	8.65	9.28	9.39	8.21	7.04	8.62
Maneuvering	3.46	3.51	3.76	3.81	3.33	2.58	3.46
S.C. Change	17.60	17.60	21.60	15.60	13.20	15.30	17.12
Gas Test & Safety	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ventilation & Posts	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Tram	3.48	3.60	3.66	3.30	3.00	3.75	3.48
Total Place Time	39.69	39.96	44.90	38.70	34.34	35.27	39.27
Roof Bolting Place Time	38.80	40.20	39.50	38.75	36.80	37.00	38.67
Places/Unit Shift	7.461	7.353	6.615	7.492	8.090	7.462	7.42
Productivity - Clean Coal							
Tons/Unit Shift	465.6	464.5	448.2	513.8	484.8	383.6	462.4
Tons/Hour	94.3	94.3	90.5	106.2	97.7	83.4	94.8
Tons/Minute	1.572	1.571	1.509	1.770	1.628	1.389	1.580
Annual Production, st	233,729	222,947	240,231	271,260	171,603	145,781	1,285,552

Cost of Mining Statement
Base Year 1992

Basis of Estimates	Adj. Time St. Data	Uptime by 30 Minutes For 75% Efficiency
Days of Operation	240	240
Total Production (Clean st) (000)	956.369	1,285.552
Daily Production (Clean st)	3,985	5,356
Approx. st/worker-day	18.113	25.752

Cost basis	Dollars(000)	\$/st	Dollars(000)	\$/st
A. Direct Operating Costs				
* 1. Labor - Salaried	1,575.000	1.647	1,575.000	1.225
* 2. Labor - Hourly	7,104.000	7.428	6,677.760	5.194
* 3. Benefits - Salaried	473.000	0.495	473.000	0.368
* 4. Benefits - Hourly	2,842.000	2.972	2,671.480	2.078
5. Supplies - Operating	2,419.614	2.530	3,252.447	2.530
* 6. Supplies - Maintenance	5,001.000	5.229	5,001.000	3.890
* 7. Power	1,200.000	1.255	1,200.000	0.933
* 8. FICA & Unemployment Taxes	960.560	1.004	960.560	0.747
* 9. Workmans Compensation Ins.	1,800.000	1.882	1,800.000	1.400
* 10. Black Lung Comp. Ins.	2,000.000	2.091	2,000.000	1.556
* 11. Welfare - Hourly	1,000.000	1.046	940.000	0.731
12. Welfare - Tonnage	0.000	0.000	0.000	0.000
* 13. Safety Expenses	250.000	0.261	250.000	0.194
* 14. Production & Safety Incentives	300.000	0.314	300.000	0.233
* 15. Accident Costs	300.000	0.314	300.000	0.233
16. Reclamation Fee	143.455	0.150	192.833	0.150
17. Federal Black Lung Fee	1,052.006	1.100	1,414.107	1.100
* 18. Other Costs	0.000	0.000	0.000	0.000
Total	28,420.635	29.717	29,008.187	22.565
B. Other Cash Costs				
* 1. Overhead	300.000	0.314	300.000	0.233
2. Royalties	605.382	0.633	813.754	0.633
3. Miscellaneous Taxes	0.000	0.000	0.000	0.000
* 4. Equipment Leasing Costs	600.000	0.627	600.000	0.467
* 5. Interest Expense	500.000	0.523	525.000	0.408
* 6. Miscellaneous Income	0.000	0.000	0.000	0.000
Total	2,005.382	2.097	2,238.754	1.741
C. Other Costs				
* 1. Depreciation	600.000	0.627	635.714	0.495
2. Amortization of Development Costs	0.000	0.000	0.000	0.000
3. Depletion	0.000	0.000	0.000	0.000
Total	600.000	0.627	635.714	0.495
Total Cost of Mining	31,026.016	32.441	31,882.655	24.801

* Fixed Dollars Per Year

MINE PRODUCTION MODEL BY CONTINUOUS MINER SECTION
IMPROVED UPTIME BY 40 MINUTES FOR 75% EFFICIENCY

ITEM IDENTIFICATION	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	TOTAL/AVG
Minutes Per Shift	480.0	480.0	480.0	480.0	480.0	480.0	480.0
Travel Time	60.0	62.0	65.0	58.0	62.0	64.0	61.7
Lunch Time	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Service Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Operating Time	390.0	388.0	385.0	392.0	388.0	386.0	388.3
Downtime							
Miner	12.8	15.0	8.0	19.4	0.0	20.0	12.9
S.C.	5.0	0.2	2.0	5.5	2.0	8.2	3.7
Belt	11.0	12.2	18.0	8.5	11.0	9.5	11.9
Bolter	4.8	5.0	6.0	5.9	8.0	4.6	5.7
Feeder	3.0	3.8	4.2	3.6	5.0	6.8	4.3
C/PTM	30.5	31.0	22.0	28.8	35.0	38.0	30.2
Power	1.8	1.0	2.0	2.5	2.8	1.9	2.0
Timber & Rail	2.0	2.9	3.0	5.0	5.3	3.0	3.5
Conditions	5.0	5.8	6.0	2.5	4.2	2.8	4.5
Safety	8.0	5.5	6.8	10.0	7.0	5.1	7.2
Model Adjust Delays	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Downtime	83.9	82.4	78.0	91.7	80.3	99.9	85.7
Remaining Uptime	306.1	305.6	307.0	300.3	307.7	286.1	302.6
Unit Shifts/Year	502	480	536	528	354	380	2780
Cubic Feet/Place	1710.7	1731.7	1857.4	1880.0	1642.8	1409.4	1724.9
Density	94.50	94.50	94.50	94.50	94.50	94.50	94.50
Raw Tons/Place	80.8	81.8	87.8	88.8	77.6	66.6	81.5
Raw Tons/S.C.	7.0	7.0	7.0	7.0	7.0	7.0	7.0
No. S.C./Place	11.5	11.7	12.5	12.7	11.1	9.5	11.6
Reject %	22.80	22.80	22.80	22.80	22.80	22.80	22.80
Clean Tons/S.C.	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Place Time							
Mining	8.55	8.65	9.28	9.39	8.21	7.04	8.62
Maneuvering	3.46	3.51	3.76	3.81	3.33	2.58	3.46
S.C. Change	17.60	17.60	21.60	15.60	13.20	15.30	17.12
Gas Test & Safety	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ventilation & Posts	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Tram	3.48	3.60	3.66	3.30	3.00	3.75	3.48
Total Place Time	39.69	39.96	44.90	38.70	34.34	35.27	39.27
Roof Bolting Place Time	38.80	40.20	39.50	38.75	36.80	37.00	38.67
Places/Unit Shift	7.713	7.602	6.838	7.750	8.361	7.732	7.68
Productivity - Clean Coal							
Tons/Unit Shift	481.3	480.2	463.3	531.4	501.0	397.5	478.2
Tons/Hour	94.3	94.3	90.5	106.2	97.7	83.4	94.8
Tons/Minute	1.572	1.571	1.509	1.770	1.628	1.389	1.580
Annual Production, st	241,623	230,489	248,320	280,604	177,368	151,061	1,329,465

Cost of Mining Statement
Base Year 1992

Basis of Estimates	Adj. Time St. Data	Uptime by 40 Minutes For 75% Efficiency
Days of Operation	240	240
Total Production (Clean st) (000)	956.369	1,329.465
Daily Production (Clean st)	3,985	5,539
Approx. st/worker-day	18.113	26.632

Cost basis	Dollars(000)	\$/st	Dollars(000)	\$/st
A. Direct Operating Costs				
* 1. Labor - Salaried	1,575.000	1.647	1,575.000	1.185
* 2. Labor - Hourly	7,104.000	7.428	6,677.760	5.023
* 3. Benefits - Salaried	473.000	0.495	473.000	0.356
* 4. Benefits - Hourly	2,842.000	2.972	2,671.480	2.009
5. Supplies - Operating	2,419.614	2.530	3,363.546	2.530
* 6. Supplies - Maintenance	5,001.000	5.229	5,001.000	3.762
* 7. Power	1,200.000	1.255	1,200.000	0.903
* 8. FICA & Unemployment Taxes	960.560	1.004	960.560	0.723
* 9. Workmans Compensation Ins.	1,800.000	1.882	1,800.000	1.354
* 10. Black Lung Comp. Ins.	2,000.000	2.091	2,000.000	1.504
* 11. Welfare - Hourly	1,000.000	1.046	940.000	0.707
12. Welfare - Tonnage	0.000	0.000	0.000	0.000
* 13. Safety Expenses	250.000	0.261	250.000	0.188
* 14. Production & Safety Incentives	300.000	0.314	300.000	0.226
* 15. Accident Costs	300.000	0.314	300.000	0.226
16. Reclamation Fee	143.455	0.150	199.420	0.150
17. Federal Black Lung Fee	1,052.006	1.100	1,462.412	1.100
* 18. Other Costs	0.000	0.000	0.000	0.000
Total	28,420.635	29.717	29,174.178	21.944
B. Other Cash Costs				
* 1. Overhead	300.000	0.314	300.000	0.226
* 2. Royalties	605.382	0.633	841.551	0.633
3. Miscellaneous Taxes	0.000	0.000	0.000	0.000
* 4. Equipment Leasing Costs	600.000	0.627	600.000	0.451
* 5. Interest Expense	500.000	0.523	525.000	0.395
* 6. Miscellaneous Income	0.000	0.000	0.000	0.000
Total	2,005.382	2.097	2,266.551	1.705
C. Other Costs				
* 1. Depreciation	600.000	0.627	635.714	0.478
2. Amortization of Development Costs	0.000	0.000	0.000	0.000
3. Depletion	0.000	0.000	0.000	0.000
Total	600.000	0.627	635.714	0.478
Total Cost of Mining	31,026.016	32.441	32,076.443	24.127

* Fixed Dollars Per Year

MINE PRODUCTION MODEL BY CONTINUOUS MINER SECTION
IMPROVED UPTIME BY 50 MINUTES FOR 75% EFFICIENCY

ITEM IDENTIFICATION	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	TOTAL/AVG
Minutes Per Shift	480.0	480.0	480.0	480.0	480.0	480.0	480.0
Travel Time	60.0	62.0	65.0	58.0	62.0	64.0	61.7
Lunch Time	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Service Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Operating Time	390.0	388.0	385.0	392.0	388.0	386.0	388.3
Downtime							
Miner	12.8	15.0	8.0	19.4	0.0	20.0	12.9
S.C.	5.0	0.2	2.0	5.5	2.0	8.2	3.7
Belt	6.0	7.2	13.0	3.5	6.0	4.5	6.9
Bolter	4.8	5.0	6.0	5.9	8.0	4.6	5.7
Feeder	3.0	3.8	4.2	3.6	5.0	6.8	4.3
C/PTM	30.5	31.0	22.0	28.8	35.0	38.0	30.2
Power	1.8	1.0	2.0	2.5	2.8	1.9	2.0
Timber & Rail	2.0	2.9	3.0	5.0	5.3	3.0	3.5
Conditions	5.0	5.8	6.0	2.5	4.2	2.8	4.5
Safety	3.0	0.5	1.8	5.0	2.0	0.1	2.2
Model Adjust Delays	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Downtime	73.9	72.4	68.0	81.7	70.3	89.9	75.7
Remaining Uptime	316.1	315.6	317.0	310.3	317.7	296.1	312.6
Unit Shifts/Year	502	480	536	528	354	380	2780
Cubic Feet/Place	1710.7	1731.7	1857.4	1880.0	1642.8	1409.4	1724.9
Density	94.50	94.50	94.50	94.50	94.50	94.50	94.50
Raw Tons/Place	80.8	81.8	87.8	88.8	77.6	66.6	81.5
Raw Tons/S.C.	7.0	7.0	7.0	7.0	7.0	7.0	7.0
No. S.C./Place	11.5	11.7	12.5	12.7	11.1	9.5	11.6
Reject %	22.80	22.80	22.80	22.80	22.80	22.80	22.80
Clean Tons/S.C.	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Place Time							
Mining	8.55	8.65	9.28	9.39	8.21	7.04	8.62
Maneuvering	3.46	3.51	3.76	3.81	3.33	2.58	3.46
S.C. Change	17.60	17.60	21.60	15.60	13.20	15.30	17.12
Gas Test & Safety	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ventilation & Posts	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Tram	3.48	3.60	3.66	3.30	3.00	3.75	3.48
Total Place Time	39.69	39.96	44.90	38.70	34.34	35.27	39.27
Roof Bolting Place Time	38.80	40.20	39.50	38.75	36.80	37.00	38.67
Places/Unit Shift	7.965	7.851	7.060	8.008	8.633	8.003	7.93
Productivity - Clean Coal							
Tons/Unit Shift	497.0	495.9	478.4	549.1	517.3	411.4	494.0
Tons/Hour	94.3	94.3	90.5	106.2	97.7	83.4	94.8
Tons/Minute	1.572	1.571	1.509	1.770	1.628	1.389	1.580
Annual Production, st	249,517	238,031	256,408	289,949	183,132	156,341	1,373,378

Cost of Mining Statement
Base Year 1992

Basis of Estimates	Adj. Time St. Data	Uptime by 50 Minutes For 75% Efficiency
Days of Operation	240	240
Total Production (Clean st) (000)	956.369	1,373.378
Daily Production (Clean st)	3,985	5,722
Approx. st/worker-day	18.113	27.512

Cost basis	Dollars(000)	\$/st	Dollars(000)	\$/st
A. Direct Operating Costs				
* 1. Labor - Salaried	1,575.000	1.647	1,575.000	1.147
* 2. Labor - Hourly	7,104.000	7.428	6,677.760	4.862
* 3. Benefits - Salaried	473.000	0.495	473.000	0.344
* 4. Benefits - Hourly	2,842.000	2.972	2,671.480	1.945
5. Supplies - Operating	2,419.614	2.530	3,474.646	2.530
* 6. Supplies - Maintenance	5,001.000	5.229	5,001.000	3.641
* 7. Power	1,200.000	1.255	1,200.000	0.874
* 8. FICA & Unemployment Taxes	960.560	1.004	960.560	0.699
* 9. Workmans Compensation Ins.	1,800.000	1.882	1,800.000	1.311
* 10. Black Lung Comp. Ins.	2,000.000	2.091	2,000.000	1.456
* 11. Welfare - Hourly	1,000.000	1.046	940.000	0.684
12. Welfare - Tonnage	0.000	0.000	0.000	0.000
* 13. Safety Expenses	250.000	0.261	250.000	0.182
* 14. Production & Safety Incentives	300.000	0.314	300.000	0.218
* 15. Accident Costs	300.000	0.314	300.000	0.218
16. Reclamation Fee	143.455	0.150	206.007	0.150
17. Federal Black Lung Fee	1,052.006	1.100	1,510.716	1.100
* 18. Other Costs	0.000	0.000	0.000	0.000
Total	28,420.635	29.717	29,340.169	21.364
B. Other Cash Costs				
* 1. Overhead	300.000	0.314	300.000	0.218
2. Royalties	605.382	0.633	869.348	0.633
3. Miscellaneous Taxes	0.000	0.000	0.000	0.000
* 4. Equipment Leasing Costs	600.000	0.627	600.000	0.437
* 5. Interest Expense	500.000	0.523	525.000	0.382
* 6. Miscellaneous Income	0.000	0.000	0.000	0.000
Total	2,005.382	2.097	2,294.348	1.671
C. Other Costs				
* 1. Depreciation	600.000	0.627	635.714	0.463
2. Amortization of Development Costs	0.000	0.000	0.000	0.000
3. Depletion	0.000	0.000	0.000	0.000
Total	600.000	0.627	635.714	0.463
Total Cost of Mining	31,026.016	32.441	32,270.231	23.497

* Fixed Dollars Per Year

MINE PRODUCTION MODEL BY CONTINUOUS MINER SECTION
IMPROVED UPTIME BY 30 MINUTES FOR 100% EFFICIENCY

ITEM IDENTIFICATION	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	TOTAL/AVG
Minutes Per Shift	480.0	480.0	480.0	480.0	480.0	480.0	480.0
Travel Time	60.0	62.0	65.0	58.0	62.0	64.0	61.7
Lunch Time	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Service Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Operating Time	390.0	388.0	385.0	392.0	388.0	386.0	388.3
Downtime							
Miner	12.8	15.0	8.0	19.4	0.0	20.0	12.9
S.C.	5.0	0.2	2.0	5.5	2.0	8.2	3.7
Belt	11.0	12.2	18.0	8.5	11.0	9.5	11.9
Bolter	4.8	5.0	6.0	5.9	8.0	4.6	5.7
Feeder	3.0	3.8	4.2	3.6	5.0	6.8	4.3
C/PTM	30.5	31.0	22.0	28.8	35.0	38.0	30.2
Power	1.8	1.0	2.0	2.5	2.8	1.9	2.0
Timber & Rail	2.0	2.9	3.0	5.0	5.3	3.0	3.5
Conditions	5.0	5.8	6.0	2.5	4.2	2.8	4.5
Safety	18.0	15.5	16.8	20.0	17.0	15.1	17.2
Model Adjust Delays	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Downtime	93.9	92.4	88.0	101.7	90.3	109.9	95.7
Remaining Uptime	296.1	295.6	297.0	290.3	297.7	276.1	292.6
Unit Shifts/Year	502	480	536	528	354	380	2780
Cubic Feet/Place	1710.7	1731.7	1857.4	1880.0	1642.8	1409.4	1724.9
Density	94.50	94.50	94.50	94.50	94.50	94.50	94.50
Raw Tons/Place	80.8	81.8	87.8	88.8	77.6	66.6	81.5
S.C. Change	7.0	7.0	7.0	7.0	7.0	7.0	7.0
No. S.C./Place	11.5	11.7	12.5	12.7	11.1	9.5	11.6
Reject %	22.80	22.80	22.80	22.80	22.80	22.80	22.80
Clean Tons/S.C.	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Place Time							
Mining	7.51	7.60	8.15	8.25	7.21	6.18	7.57
Maneuvering	3.46	3.51	3.76	3.81	3.33	2.58	3.46
S.C. Change	17.60	17.60	21.60	15.60	13.20	15.30	17.12
Gas Test & Safety	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ventilation & Posts	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Tram	3.48	3.60	3.66	3.30	3.00	3.75	3.48
Total Place Time	38.65	38.91	43.77	37.56	33.34	34.41	38.22
Roof Bolting Place Time	38.80	40.20	39.50	38.75	36.80	37.00	38.67
Places/Unit Shift	7.631	7.353	6.786	7.492	8.090	7.462	7.49
Productivity - Clean Coal							
Tons/Unit Shift	476.2	464.5	459.7	513.8	484.8	383.6	466.6
Tons/Hour	96.5	94.3	92.9	106.2	97.7	83.4	95.6
Tons/Minute	1.608	1.571	1.548	1.770	1.628	1.389	1.594
Annual Production, st	239,061	222,947	246,424	271,260	171,603	145,781	1,297,077

Cost of Mining Statement
Base Year 1992

Basis of Estimates	Adj. Time St. Data	Uptime by 30 Minutes For 100% Efficiency
Days of Operation	240	240
Total Production (Clean st) (000)	956.369	1,297.077
Daily Production (Clean st)	3,985	5,404
Approx. st/worker-day	18.113	25.983

Cost basis	Dollars(000)	\$/st	Dollars(000)	\$/st
A. Direct Operating Costs				
* 1. Labor - Salaried	1,575.000	1.647	1,575.000	1.214
* 2. Labor - Hourly	7,104.000	7.428	6,677.760	5.148
* 3. Benefits - Salaried	473.000	0.495	473.000	0.365
* 4. Benefits - Hourly	2,842.000	2.972	2,671.480	2.060
5. Supplies - Operating	2,419.614	2.530	3,281.605	2.530
* 6. Supplies - Maintenance	5,001.000	5.229	5,001.000	3.856
* 7. Power	1,200.000	1.255	1,200.000	0.925
* 8. FICA & Unemployment Taxes	960.560	1.004	960.560	0.741
* 9. Workmans Compensation Ins.	1,800.000	1.882	1,800.000	1.388
* 10. Black Lung Comp. Ins.	2,000.000	2.091	2,000.000	1.542
* 11. Welfare - Hourly	1,000.000	1.046	940.000	0.725
12. Welfare - Tonnage	0.000	0.000	0.000	0.000
* 13. Safety Expenses	250.000	0.261	250.000	0.193
* 14. Production & Safety Incentives	300.000	0.314	300.000	0.231
* 15. Accident Costs	300.000	0.314	300.000	0.231
16. Reclamation Fee	143.455	0.150	194.562	0.150
17. Federal Black Lung Fee	1,052.006	1.100	1,426.785	1.100
* 18. Other Costs	0.000	0.000	0.000	0.000
Total	28,420.635	29.717	29,051.751	22.398
B. Other Cash Costs				
* 1. Overhead	300.000	0.314	300.000	0.231
2. Royalties	605.382	0.633	821.050	0.633
3. Miscellaneous Taxes	0.000	0.000	0.000	0.000
* 4. Equipment Leasing Costs	600.000	0.627	600.000	0.463
* 5. Interest Expense	500.000	0.523	525.000	0.405
* 6. Miscellaneous Income	0.000	0.000	0.000	0.000
Total	2,005.382	2.097	2,246.050	1.732
C. Other Costs				
* 1. Depreciation	600.000	0.627	635.714	0.490
2. Amortization of Development Costs	0.000	0.000	0.000	0.000
3. Depletion	0.000	0.000	0.000	0.000
Total	600.000	0.627	635.714	0.490
Total Cost of Mining	31,026.016	32.441	31,933.515	24.620

* Fixed Dollars Per Year

MINE PRODUCTION MODEL BY CONTINUOUS MINER SECTION
IMPROVED UPTIME BY 40 MINUTES FOR 100% EFFICIENCY

ITEM IDENTIFICATION	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	TOTAL/AVG
Minutes Per Shift	480.0	480.0	480.0	480.0	480.0	480.0	480.0
Travel Time	60.0	62.0	65.0	58.0	62.0	64.0	61.7
Lunch Time	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Service Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Operating Time	390.0	388.0	385.0	392.0	388.0	386.0	388.3
Downtime							
Miner	12.8	15.0	8.0	19.4	0.0	20.0	12.9
S.C.	5.0	0.2	2.0	5.5	2.0	8.2	3.7
Belt	11.0	12.2	18.0	8.5	11.0	11.9	11.9
Bolter	4.8	5.0	6.0	5.9	8.0	4.6	5.7
Feeder	3.0	3.8	4.2	3.6	5.0	6.8	4.3
C/PTM	30.5	31.0	22.0	28.8	35.0	38.0	30.2
Power	1.8	1.0	2.0	2.5	2.8	1.9	2.0
Timber & Rail	2.0	2.9	3.0	5.0	5.3	3.0	3.5
Conditions	5.0	5.8	6.0	2.5	4.2	2.8	4.5
Safety	8.0	5.5	6.8	10.0	7.0	5.1	7.2
Model Adjust Delays	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Downtime	83.9	82.4	78.0	91.7	80.3	99.9	85.7
Remaining Uptime	306.1	305.6	307.0	300.3	307.7	286.1	302.6
Unit Shifts/Year	502	480	536	528	354	380	2780
Cubic Feet/Place	1710.7	1731.7	1857.4	1880.0	1642.8	1409.4	1724.9
Density	94.50	94.50	94.50	94.50	94.50	94.50	94.50
Raw Tons/Place	80.8	81.8	87.8	88.8	77.6	66.6	81.5
Raw Tons/S.C.	7.0	7.0	7.0	7.0	7.0	7.0	7.0
No. S.C./Place	11.5	11.7	12.5	12.7	11.1	9.5	11.6
Reject %	22.80	22.80	22.80	22.80	22.80	22.80	22.80
Clean Tons/S.C.	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Place Time							
Mining	7.51	7.60	8.15	8.25	7.21	6.18	7.57
Maneuvering	3.46	3.51	3.76	3.81	3.33	2.58	3.46
S.C. Change	17.60	17.60	21.60	15.60	13.20	15.30	17.12
Gas Test & Safety	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ventilation & Posts	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Tram	3.48	3.60	3.66	3.30	3.00	3.75	3.48
Total Place Time	38.65	38.91	43.77	37.56	33.34	34.41	38.22
Roof Bolting Place Time	38.80	40.20	39.50	38.75	36.80	37.00	38.67
Places/Unit Shift	7.889	7.602	7.014	7.750	8.361	7.732	7.74
Productivity - Clean Coal							
Tons/Unit Shift	492.3	480.2	475.2	531.4	501.0	397.5	482.5
Tons/Hour	96.5	94.3	92.9	106.2	97.7	83.4	95.6
Tons/Minute	1.608	1.571	1.548	1.770	1.628	1.389	1.594
Annual Production, st	247,134	230,489	254,721	280,604	177,368	151,061	1,341,378

Cost of Mining Statement
Base Year 1992

Basis of Estimates	Adj. Time St. Data	Uptime by 40 Minutes For 100% Efficiency
Days of Operation	240	240
Total Production (Clean st) (000)	956.369	1,341.378
Daily Production (Clean st)	3,985	5,589
Approx. st/worker-day	18.113	26.871

Cost basis	Dollars(000)	\$/st	Dollars(000)	\$/st
A. Direct Operating Costs				
* 1. Labor - Salaried	1,575.000	1.647	1,575.000	1.174
* 2. Labor - Hourly	7,104.000	7.428	6,677.760	4.978
* 3. Benefits - Salaried	473.000	0.495	473.000	0.353
* 4. Benefits - Hourly	2,842.000	2.972	2,671.480	1.992
5. Supplies - Operating	2,419.614	2.530	3,393.686	2.530
* 6. Supplies - Maintenance	5,001.000	5.229	5,001.000	3.728
* 7. Power	1,200.000	1.255	1,200.000	0.895
* 8. FICA & Unemployment Taxes	960.560	1.004	960.560	0.716
* 9. Workmans Compensation Ins.	1,800.000	1.882	1,800.000	1.342
* 10. Black Lung Comp. Ins.	2,000.000	2.091	2,000.000	1.491
* 11. Welfare - Hourly	1,000.000	1.046	940.000	0.701
12. Welfare - Tonnage	0.000	0.000	0.000	0.000
* 13. Safety Expenses	250.000	0.261	250.000	0.186
* 14. Production & Safety Incentives	300.000	0.314	300.000	0.224
* 15. Accident Costs	300.000	0.314	300.000	0.224
16. Reclamation Fee	143.455	0.150	201.207	0.150
17. Federal Black Lung Fee	1,052.006	1.100	1,475.516	1.100
* 18. Other Costs	0.000	0.000	0.000	0.000
Total	28,420.635	29.717	29,219.209	21.783
B. Other Cash Costs				
* 1. Overhead	300.000	0.314	300.000	0.224
2. Royalties	605.382	0.633	849.092	0.633
3. Miscellaneous Taxes	0.000	0.000	0.000	0.000
* 4. Equipment Leasing Costs	600.000	0.627	600.000	0.447
* 5. Interest Expense	500.000	0.523	525.000	0.391
* 6. Miscellaneous Income	0.000	0.000	0.000	0.000
Total	2,005.382	2.097	2,274.092	1.695
C. Other Costs				
* 1. Depreciation	600.000	0.627	635.714	0.474
2. Amortization of Development Costs	0.000	0.000	0.000	0.000
3. Depletion	0.000	0.000	0.000	0.000
Total	600.000	0.627	635.714	0.474
Total Cost of Mining	31,026.016	32.441	32,129.015	23.952

* Fixed Dollars Per Year

MINE PRODUCTION MODEL BY CONTINUOUS MINER SECTION
IMPROVED UPTIME BY 50 MINUTES FOR 100% EFFICIENCY

ITEM IDENTIFICATION	SECTION 1	SECTION 2	SECTION 3	SECTION 4	SECTION 5	SECTION 6	TOTAL/AVG
Minutes Per Shift	480.0	480.0	480.0	480.0	480.0	480.0	480.0
Travel Time	60.0	62.0	65.0	58.0	62.0	64.0	61.7
Lunch Time	30.0	30.0	30.0	30.0	30.0	30.0	30.0
Service Time	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Remaining Operating Time	390.0	388.0	385.0	392.0	388.0	386.0	388.3
Downtime							
Miner	12.8	15.0	8.0	19.4	0.0	20.0	12.9
S.C.	5.0	0.2	2.0	5.5	2.0	8.2	3.7
Belt	6.0	7.2	13.0	3.5	6.0	4.5	6.9
Bolter	4.8	5.0	6.0	5.9	8.0	4.6	5.7
Feeder	3.0	3.8	4.2	3.6	5.0	6.8	4.3
C/PTM	30.5	31.0	22.0	28.8	35.0	38.0	30.2
Power	1.8	1.0	2.0	2.5	2.8	1.9	2.0
Timber & Rail	2.0	2.9	3.0	5.0	5.3	3.0	3.5
Conditions	5.0	5.8	6.0	2.5	4.2	2.8	4.5
Safety	3.0	0.5	1.8	5.0	2.0	0.1	2.2
Model Adjust Delays	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Downtime	73.9	72.4	68.0	81.7	70.3	89.9	75.7
Remaining Uptime	316.1	315.6	317.0	310.3	317.7	296.1	312.6
Unit Shifts/Year	502	480	536	528	354	380	2780
Cubic Feet/Place	1710.7	1731.7	1857.4	1880.0	1642.8	1409.4	1724.9
Density	94.50	94.50	94.50	94.50	94.50	94.50	94.50
Raw Tons/Place	80.8	81.8	87.8	88.8	77.6	66.6	81.5
Raw Tons/S.C.	7.0	7.0	7.0	7.0	7.0	7.0	7.0
No. S.C./Place	11.5	11.7	12.5	12.7	11.1	9.5	11.6
Reject &	22.80	22.80	22.80	22.80	22.80	22.80	22.80
Clean Tons/S.C.	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Place Time							
Mining	7.51	7.60	8.15	8.25	7.21	6.18	7.57
Maneuvering	3.46	3.51	3.76	3.81	3.33	2.58	3.46
S.C. Change	17.60	17.60	21.60	15.60	13.20	15.30	17.12
Gas Test & Safety	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Ventilation & Posts	6.60	6.60	6.60	6.60	6.60	6.60	6.60
Tram	3.48	3.60	3.66	3.30	3.00	3.75	3.48
Total Place Time	38.65	38.91	43.77	37.56	33.34	34.41	38.22
Roof Bolting Place Time	38.80	40.20	39.50	38.75	36.80	37.00	38.67
Places/Unit Shift	8.147	7.851	7.242	8.008	8.633	8.003	8.00
Productivity - Clean Coal							
Tons/Unit Shift	508.4	495.9	490.7	549.1	517.3	411.4	498.4
Tons/Hour	96.5	94.3	92.9	106.2	97.7	83.4	95.6
Tons/Minute	1.608	1.571	1.548	1.770	1.628	1.389	1.594
Annual Production, st	255,208	238,031	263,018	289,949	183,132	156,341	1,385,679

**Cost of Mining Statement
Base Year 1992**

Basis of Estimates	Adj. Time St. Data	Uptime by 50 Minutes For 100% Efficiency
Days of Operation	240	240
Total Production (Clean st) (000)	956.369	1,385.679
Daily Production (Clean st)	3,985	5,774
Approx. st/worker-day	18.113	27.758

Cost basis	Dollars(000)	\$/st	Dollars(000)	\$/st
A. Direct Operating Costs				
* 1. Labor - Salaried	1,575.000	1.647	1,575.000	1.137
* 2. Labor - Hourly	7,104.000	7.428	6,677.760	4.819
* 3. Benefits - Salaried	473.000	0.495	473.000	0.341
* 4. Benefits - Hourly	2,842.000	2.972	2,671.480	1.928
5. Supplies - Operating	2,419.614	2.530	3,505.768	2.530
* 6. Supplies - Maintenance	5,001.000	5.229	5,001.000	3.609
* 7. Power	1,200.000	1.255	1,200.000	0.866
* 8. FICA & Unemployment Taxes	960.560	1.004	960.560	0.693
* 9. Workmans Compensation Ins.	1,800.000	1.882	1,800.000	1.299
* 10. Black Lung Comp. Ins.	2,000.000	2.091	2,000.000	1.443
* 11. Welfare - Hourly	1,000.000	1.046	940.000	0.678
12. Welfare - Tonnage	0.000	0.000	0.000	0.000
* 13. Safety Expenses	250.000	0.261	250.000	0.180
* 14. Production & Safety Incentives	300.000	0.314	300.000	0.217
* 15. Accident Costs	300.000	0.314	300.000	0.217
16. Reclamation Fee	143.455	0.150	207.852	0.150
17. Federal Black Lung Fee	1,052.006	1.100	1,524.247	1.100
* 18. Other Costs	0.000	0.000	0.000	0.000
Total	28,420.635	29.717	29,386.667	21.207
B. Other Cash Costs				
* 1. Overhead	300.000	0.314	300.000	0.217
2. Royalties	605.382	0.633	877.135	0.633
3. Miscellaneous Taxes	0.000	0.000	0.000	0.000
* 4. Equipment Leasing Costs	600.000	0.627	600.000	0.433
* 5. Interest Expense	500.000	0.523	525.000	0.379
* 6. Miscellaneous Income	0.000	0.000	0.000	0.000
Total	2,005.382	2.097	2,302.135	1.661
C. Other Costs				
* 1. Depreciation	600.000	0.627	635.714	0.459
2. Amortization of Development Costs	0.000	0.000	0.000	0.000
3. Depletion	0.000	0.000	0.000	0.000
Total	600.000	0.627	635.714	0.459
Total Cost of Mining	31,026.016	32.441	32,324.515	23.328

* Fixed Dollars Per Year